2018 10th International Conference on Education Technology and Computers

ICETC 2018

2018 9th International Conference on Distance Learning and Education

ICDLE 2018

October 26-28, 2018
Tokyo, Japan

Conference Venue: Tamachi Campus Innovation Center, Tokyo Institute of Technology
Add.: 3 Chome-3-6 Shibaura, Minato, Tokyo 108-0023, Japan

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## Agenda at a Glance

### Schedule for October 26

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<th>Room 4</th>
<th>10:00-17:00</th>
<th>Onsite Registration &amp; Materials Collection</th>
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### Half-day Excursion

**Time:** 14:00-18:00  
**Assembly Point:** Room 4

**Route:** Seaside Top -- Imperial Palace Plaza -- Ginza <Drive By> -- Sensoji Temple & Nakamise Shopping Street -- Sumida River Cruise

**Attention:**
- The cost of the half-day excursion is 100USD per person, including the fees of bus, tourist guide and entrance tickets.
- Please keep your belongings with you.
- Participants should apply for the excursion in advance.
- The bus will leave on time. Please arrive at the assembly point at 13:45.

Thanks for your kind understanding!

### Schedule for October 27

**<Morning> Time:** 9:00-12:20  
**Venue:** Auditorium

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker</th>
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</table>
| 9:00-9:10 | Opening Remarks                  | Prof. Minoru Nakayama  
Tokyo Institute of Technology, Japan |
| 9:10-9:50 | Keynote Speech                  | Prof. Hiroki Oura  
Tokyo Institute of Technology, Japan |
| 9:50-10:30 | Keynote Speech                  | Prof. Joy Kutaka-Kennedy  
National University, USA |
## AGENDA

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>10:30-11:10</td>
<td>Coffee Break &amp; Group Photo</td>
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<tr>
<td>11:10-11:50</td>
<td>Keynote Speech</td>
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<td><strong>Prof. Piet Kommers</strong>&lt;br&gt; UNESCO Learning Technologies University of Twente, Netherlands</td>
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<tr>
<td>11:50-12:20</td>
<td>Plenary Speech</td>
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<td><strong>Prof. Silvio Carvalho Netoo</strong>&lt;br&gt; Centro Universitário Municipal de Franca - Uni-FACEF, Brazil</td>
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<tr>
<td>12:20-13:30</td>
<td>Lunch (Room 1 &amp; 2)</td>
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</tbody>
</table>

### Schedule for October 27

**<Afternoon> Time: 13:30-17:00**

| Room 1 | Time: 14:30—15:45 | Session I  
|--------|-------------------|-------------------|
|        | Basic Education and Higher Education  
|        | (5 Presentations) |
|        | J109-A; J034; J092; J099-A; J080 |

| Room 2 | Time: 14:30—15:45 | Session II  
|--------|-------------------|-------------------|
|        | Teaching and Management  
|        | (5 Presentations) |
|        | J102; J129; J3001; J107; J044 |

| Room 3 | Time: 13:30—15:15 | Session III  
|--------|-------------------|-------------------|
|        | Course Design and Classroom Learning  
|        | (7 Presentations) |
|        | J058; J108; J2012; J127; J3006; J094; J083 |

|        | Time: 15:15—15:30 | Coffee break |
|        |                   |                |

|        | Time: 15:30—17:00 | Session IV  
|        | Educational Theory and Method  
|        | (6 Presentations) |
|        | J093; J1004; J100; J066; J2008-A; J3004-A |
# AGENDA

| Room 4 | 13:30—15:15 | Session V  
Online Learning and Learning Environment  
(7 Presentations)  
J050; J101; J045;  
J059; J112; J2014-A; J2006 |
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<td>15:15—15:30</td>
<td>Coffee break</td>
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</table>
| | 15:30—17:00 | Session VI  
Gamification Teaching and Innovative Technology  
(6 Presentations)  
J038; J065; J081;  
J097; J019; J2005 |

| Room 1 & Room 2 | 17:00—18:30 | Dinner |

## Schedule for October 28  
<Morning> Time: 9:00-12:00

| Room 1 | 9:00—9:30  
Plenary Speech | Prof. Betsy J. Bannier  
Lake Region State College, USA |
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<tr>
<td></td>
<td>9:30—9:45</td>
<td>Coffee break</td>
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| | 9:45—12:00 | Session VII  
Computer Aided Teaching and Application  
(9 Presentations)  
J007-A; J121; J119; J063;  
J071; J085; J041; J137; J1009 |

| Room 4 | 9:00—9:30  
Online Plenary Speech | Assoc. Prof. Kumar Laxman  
University of Auckland, New Zealand |
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<tr>
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<td>9:30—9:45</td>
<td>Coffee break</td>
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| | 9:45—11:45 | Session VIII  
E-learning and Multimedia Teaching  
(8 Presentations)  
J096; J118; J126; J2009-A;  
J062; J106; J064; J134 |
| Room 3 | 9:45—11:00 | **Session IX**  
Computer Aided Teaching and Application  
(5 Presentations)  
J060-A; J021-A; J011; J005; J091 |
| Room 3 | 12:00—13:30 | Lunch |

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**Schedule for October 28**  
*<Afternoon> Time: 13:30-17:00*

| Room 1 | 13:30—15:15 | **Session X**  
Software Engineering and Information Technology  
(7 Presentations)  
J054; J117; J131; J2013; J086; J095; J098 |
| Room 1 | 15:15—15:30 | Coffee break |
| Room 1 | 15:30—17:00 | **Session XI**  
Software Engineering and Information Technology  
(6 Presentations)  
J136; J069; J027; J128-A; J031; J067 |

| Room 4 | 13:30—15:15 | **Session XII**  
Engineering Education and Learning  
(7 Presentations)  
J105; J040; J133; J015-A; J029; J047; J039 |
| Room 4 | 15:15—15:30 | Coffee break |
| Room 4 | 15:30—17:00 | **Session XIII**  
Business Intelligence and Product Design  
(6 Presentations)  
J017; J013; J035-A; J057; J130; J113 |

| Room 3 | 14:30—15:15 | **Session XIV (Part 1)**  
Learning Method and Purpose  
(3 Presentations) |
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<tr>
<td>15:15—15:30</td>
<td>Coffee break</td>
<td>J046-A; J056; J090</td>
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<tr>
<td>15:30—17:00</td>
<td><strong>Session XIV (Part 2)</strong></td>
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<tr>
<td></td>
<td>Learning Method and Purpose</td>
<td>J125; J1005; J079-A; J104; J052; J123</td>
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<td>(6 Presentations)</td>
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Dear delegates,

It is indeed a pleasure to welcome you to this 10th International Conference on Education Technology and Computers being held in the beautiful city of Tokyo.

This conference has been held to bridge and connect – across disciplines, practices, places and understandings, and to demonstrate the concepts of Education Technology and Computers to the world.

The conference is the 10th in a series that began in Singapore in 2009. From 2010 to 2017, it has been held annually in Shanghai (China), Changchun (China), Cape Town (South Africa), Maldives, Singapore, Berlin (Germany), Singapore, Barcelona (Spain).

The conference is not one which is isolated, but one of a continuing program of various activities. In addition, this conference blends in with that of the 9th International Conference on Distance Learning and Education providing great opportunity for ICETC participants to meet delegates in Distance Learning fields as well.

We are pleased to have 93 presentations out of 172 papers from 26 countries and regions, such as Japan, China, Malaysia, Taiwan, Indonesia, Bangladesh, Peru, Hong Kong, Italy, the United States, France, Philippines, United Arab Emirates, Ecuador, Australia, South Korea, Switzerland, Brazil, Thailand, Colombia, Qatar, Finland, Tunisia, Sweden, Mongolia and South Africa in this program, which provides a wide spectrum of researches in various areas such as Accessibility to Disabled Users, Technology Support for Pervasive Learning, Technology Enhanced Learning, Cooperation with Industry in Teaching, e-Learning Hardware and Software, Distance and e-Learning in a Global Context, Ontologies and Meta-Data Standards, etc.

We would like to welcome all of the conference participants, keynote speakers, plenary speakers, presenters of technical papers and posters, our sponsors, associates and members of the organizing and technical program committees.

Our wish is that you will enjoy this conference, contribute effectively toward it and take back with you knowledge, experiences, contacts and happy memories of this conference.

Yours Sincerely
ICETC 2018 Organizing Committee
Tokyo, Japan
NOTES & TIPS

Note:

✧ Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.

✧ You can also register at any working time during the conference.

✧ Certificate of Listener can be collected in front of the registration counter. Certificate of Presentation will be awarded after your presentation by the session chair.

✧ The organizer won't provide accommodation, and we suggest you make an early reservation.

✧ Please offer your paper ID and it is required when you register on desk.

Warm Tips for Oral Presentation:

✧ Get your presentation PPT or PDF files prepared

✧ Regular oral presentation: about 15 minutes (including Q&A)

✧ Keynote speech: about 40 minutes (including Q&A)

✧ Plenary speech: about 30 minutes (including Q&A)

✧ Laptop (with MS-Office & Adobe Reader), projector & screen, laser sticks will be provided by the conference organizer

✧ Please keep your belongings (laptop and camera etc.) with you

*Attention:

One excellent presentation will be selected from each session and the author of excellent presentation will be awarded the certificate after the session is over.
Conference Venue
Tamachi Campus Innovation Center, Tokyo Institute of Technology
Add.: 3 Chome-3-6 Shibaura, Minato, Tokyo 108-0023, Japan
http://www.cictokyo.jp/

*Note*
Please note that the hotel will not contact any participants for hotel booking, please be careful when anyone asks you to provide your credit card information to reserve room for you.
COMMITTEE

**Conference Chairs**
Prof. Minoru Nakayama, Tokyo Institute of Technology, Japan  
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Asst. Prof. Osama Halabi, Qatar University, Qatar
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Prof. Ichiro Iimura, Prefectural University of Kumamoto, Japan
Dr. Teodoro A. Macaraeg Jr., University of Caloocan City (UCC), Philippines
Assoc. Prof. Matshepo Matoane, University of South Africa, South Africa
Assoc. Prof. Kyoungae Choi, Korea Advanced Institute of Science and Technology, Korea
<October 27 Morning 9:10-9:50>
Venue: Auditorium

Prof. Hiroki Oura
Tokyo Institute of Technology, Japan

Hiroki Oura is Associate Professor at Center for Innovative Teaching and Learning (CITL), Tokyo Institute of Technology. He was co-awarded Science Prize for Inquiry-Based Instruction (IBI) in 2013 for curriculum module development to engage high-school students in database research on smoking behavior during his graduate work at University of Washington. In recent years, he has worked on research projects in MOOCs and Flipped Learning in school and out-of-school contexts. His research interests include technology-enhanced scaffolding and assessment for scientific and epistemic thinking.

Speech Title: Design Strategies to Make Learning with MOOCs Interactive

Abstract--MOOCs (Massive Open Online Courses) have been evolving since its beginning, as they are combined as part of online and campus programs that lead to both professional and academic credentials today. However, learning contents of MOOCs still depend on lecture videos and lack of design strategies to engage registrants in interactive activities with others and the instructor(s). This talk will discuss strategies to make learning with MOOCs interactive by introducing our design and implementation cases in Japan.
Dr. Joy Kutaka-Kennedy has served in the Department of Special Education at Sanford College of Education since 2003, almost 15 years. She earned her doctorate from the University of San Francisco in Curriculum and Instruction with a specialization in Mild/Moderate Special Education, completing her dissertation titled “Inclusion in secondary general education classes: What do students with Emotional and Behavioral Disorders think?” Prior to becoming an academic, she honed her teaching skills and K-12 expertise through 18 years of teaching in grades pre-K to 12 in general, special, gifted and at-risk education. She began in self-contained general education multiple subjects classrooms and single subject classrooms in English/Language Arts, World History, Biology, and Physics. She also taught a weekly pull-out of gifted students for a semester and a self-contained 4/5 class for students identified as highly gifted for a year, plus at-risk students in a court/community school setting. She entered special education and taught high school students with emotional and behavioral disorders and early childhood special education students at the county office level. She presents at numerous national and international conferences, often as a keynote speaker, on topics such as the impact of augmented and virtual reality on learning, online instruction for the 21st century, generational differences in educational technology preferences, online supervision of online K-12 teaching, online mentoring, and online course design to enhance creativity and collaboration. Her current responsibilities include course design and oversight, field work supervision, and mentoring new faculty in higher education. She serves as the Treasurer of the California Association of Professors of Special Education, completes program reviews for national accreditation, and performs editorial reviews for professional journals.

Speech Title: Lessons from Generational Differences and Corporate Trainings at the Nexus of Higher Education

Abstract--Much has been said of generational differences in the past few years. What are the implications of these differences for higher education? We have professors who are mostly Baby Boomers or Gen Xers teaching students who are mostly Millennials or Gen Zers. Furthermore, these differences emerge in the wider work force where corporate trainings target this diverse group of adult learners with specific, concrete strategies designed to address their varied learning needs. The instructional pedagogy, the concise measurable objectives, and the short-term learning environments of corporate trainings suggest possible applications for higher education. What can higher education learn from the user-friendly corporate training models? Many corporate teaching and learning modalities with their practical products and outcomes can be adapted to academia, with similar use of learning objectives, micro-learning targets,
and self-monitoring assessments. This merger of approaches from academia and corporate trainings can be productive and fruitful for students and workers in our society and collective future.
Dr. Piet Kommers is an early pioneer in media for cognitive- and social support. His doctoral research explored methods for hypertext and concept mapping in learning. Since 1982 he developed educational technology for teacher training. His main thesis is that technology is catalytic for human ambition and awareness. His main function is associate professor in the University in Twente, The Netherlands and adjunct/visiting professor in various countries. He taught more than fifteen bachelor-, master- and PhD courses and supervised more than 30 PhD students. He instigated and coordinated the NATO Advanced Research Workshop on Cognitive Technologies in 1990 and a large series of Joint European Research Projects in: authoring multimedia, web-based learning, teacher education, virtual 3d worlds, constructivist learning, social media, web-based communities and international student exchange. UNESCO awarded his work in ICT for Education in Eastern Europe with the title of Honorary Professor. The Capital Normal University in Beijing awarded his work with the title of Honorary Doctor. He is member of advisory boards in ministries of education and academia of sciences in Singapore, Finland and Russia. Piet Kommers is the initiator of the international journal for web-based communities and overall chair of the IADIS conferences on societal applications of ICT. Since the late nineties he gave more than 40 invited and keynote lectures at main conferences in the fields of education, media and communication. His books and journal articles address the social and intellectual transformations at each transition from “traditional” into the “new” media. Instead of regarding media as extrapolating, supplanting, vicarious or even disruptive, Piet’s view is that new media elicit and seduce both individuals and organizations to reconsider human nature and challenge existential awareness at that very moment. His workshop templates and experiences have been implemented into the UNESCO IITE reports, policy briefings and Master Course. The books and journal articles of Piet Kommers reach the level of 5012 citations and the h-index of 30. He was recently nominated by seventeen countries for the prestigious 2017 UNESCO King Hamad Bin Isa Al-Khalifa Prize for the Use of Information and Communication Technologies (ICTs) in Education.

Speech Title: ICT in Education: Goal, Means or Cosmetics?

Abstract--As ICT applications like social media, big data and analytics recently gained momentum, the question emerges on how to find the right balance between traditional school curricula and the new strategic problem solving skills and attitudes in regular education. This lecture will clarify how ICT and new teaching methods already got interwoven and only need to be adjusted to didactic contexts as established by the teacher. Dominant factors are the further globalising world citizenship, the 24 hour economy and the need for 21st century skills. It implies that also in regular education the pedagogy shifts from an instructional into a constructivist paradigm: students face more and more challenges to
personalise learning and prepare for entrepreneurship rather than prepare for existing jobs. Three ongoing projects will be highlighted and explained in terms of the next decade educational evolution:

1. The IV4J Project: Its goal is to give the trainers or educators, the right tools to create the right environment for their students to thrive both in the classroom, but more importantly, on the labour market, after completing their classes. [http://iv4j.eu/](http://iv4j.eu/)

2. The MakeITReal project was presented at the Engino 2018 Conference “STEM & Robotics in Education’ on March 10, 2018. ‘A new,open model: The pedagogical value of STEM & Robotics in Education’ is focussed on 3D printing for enhancing learners' spatial thinking and imagination. Its effect is targeted at those students who have a weaker capacity for abstract thinking and memorization. [http://makeitreal.info/](http://makeitreal.info/)

3. The IRNet project targets the growing trend towards international higher education. While its proponents assert that the added value of multicultural attitude, skills and mindset will help in future jobs, the question remains if and how these widening experiences contribute to the learning outcomes through the existing formal curricula. [http://www.irnet.us.edu.pl/](http://www.irnet.us.edu.pl/)

The lecture leads to answering and discussing the posed title in how far digital pedagogies supplant, reinforce or just decorate the educational establishment in the coming decade.
Prof. Silvio Carvalho Neto
Centro Universitário Municipal de Franca - Uni-FACEF, Brazil

Dr. Silvio Carvalho Neto, PhD in Management Sciences at USP - University of São Paulo with Post Doctorate at Stanford University (USA), is currently Dean of Research and Graduate Studies, and professor at Centro Universitário Municipal of Franca - São Paulo Brazil, and Professor of Financial Mathematics and Statistics in FATEC Franca (technology College) in Franca-São Paulo, Brazil. He has experience in the areas of Administration, Communication and Information Systems, with emphasis in Research in Information Technology and Communication, Research Methods, Quantitative Research, Mathematics and Statistics, Information Systems and Information Technology, acting on the following topics: Virtual Learning Environments, Online Publishing Systems, Web Systems Quality, IT Management, Technology and Digital Advertising, Marketing Research, Methods and Techniques of Quantitative Research and Regional Development.

Speech Title: Technology for Pervasive Learning: Open Access Scholarly Publishing in Brazil

Abstract--Information technology is nowadays crucial for higher education, especially in helping to disseminate the results of scientific research. The open access movement has had a strong impact in Brazil. Over the past years Brazil has shown a steady increase in the number of serials, especially with the availability of online journals that use information and communication technologies as support. Brazilian Open Access Journals are available in several open access domestic initiatives. Open Journal System, from the Public Knowledge Project, is the most used OA technology system for Scholarly Publishing in Brazil, and largely contributed to the evolution of the Brazilian Education System and to the increase of online scientific journals in this country. This presentation is about the evolution of Open Journal System in Brazil and how Open Access strengthens the concept of Pervasive Learning in Brazilian University.
Betsy Bannier is a tenured Professor of Chemistry Online at Lake Region State College in Devils Lake, North Dakota, and lives near Milwaukee, Wisconsin. She was recently selected as a Solar System Ambassador and provides educational outreach programming through an effort coordinated by NASA’s Jet Propulsion Laboratory. She holds a PhD in Adult & Continuing Education with an emphasis in online science education from the University of Wisconsin-Milwaukee, as well as an MS in analytical chemistry from the University of North Dakota. She has twenty years of experience teaching and coordinating learning activities for curious people of all ages. Her international speaking engagements and research interests currently include global trends in higher education and the motivation of online learners.

Speech Title: Distance Education 408 km High: International Space Station Global Education Programs

Abstract--The International Space Station (ISS) is arguably the most successful multinational space exploration project in the history of the world. ISS represents twenty years of technological and legal cooperation between fifteen politically diverse nations. Educational programs delivered from the International Space Station are available to us all! Discover a sample of the ISS programs and tools available to scientists, educators, and students worldwide.
Assoc. Prof. Kumar Laxman  
University of Auckland, New Zealand  

Dr Kumar Laxman is an associate professor of education with the Faculty of Education, University of Auckland. He graduated with a PhD in instructional design and technology from Macquarie University, Australia. He has been actively promoting the use of technology to advance innovation in teaching and learning and he has served as a catalytic leader in participating in numerous e-learning and educational initiatives. He is knowledgeable in the various aspects of the field of educational technology and design, having published widely in reputable journals and presented at numerous international conferences. He has also provided consultancy to a number of organizations in the domain of education, particularly enabling them to leverage upon technologies in enhancing teaching and learning. His areas of research interest include mobile learning, collaborative online learning and e-learning instructional design.

Speech Title: Lessons learnt from past research on the modalities of implementing mobile learning initiatives in schools: Nexus between theory and praxis

Abstract--In this presentation, I will be looking at trends and patterns from the findings of studies on mobile learning, what factors contribute to and inhibit effective implementation of mobile learning, what considerations need to be noted in designing mobile learning programs in schools. I will be looking at the ways in which mobile learning can be best planned for and implemented in schools so as to maximize learning efficiency and enhance teaching delivery. I will also examine the strengths and shortcomings of embedding mobile devices in educational design. Finally I will be exploring future trends of pedagogical innovations possible in schools through the use of mobile learning in curricular delivery.
< October 27 Afternoon>

Session I

Basic Education and Higher Education

14:30-15:45
Room 1

Chaired by: Assoc. Prof. Eunyoung KIM
Japan Advanced Institute of Science and Technology, Japan

Presentations: J109-A; J034; J092; J099-A; J080

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
## DECISION SUPPORT DISASTER RISK MAPPING INFORMATION SYSTEM

**Kelvin Kris C. Gonzales**  
P1 Baluarte, Santiago City, Isabela, Philippines

Abstract—The Philippines is one of the most vulnerable countries in the world to disaster and climate change. The Philippines Government, INGOs and local NGOs are all making attempts to address climate change and disasters at various levels. Thus, a Decision Support Disaster Risk Mapping Information System was conceptualized to reduce the response time during disaster and calamities. This study aimed to model the response on incidents and to offer model-derived strategies for improve rescuing situation in times of attack of disasters and calamities. This study is an added literature to the development and validation of the disaster risk app as a rescuing and mapping tool. The R&D methodology which included the assessment of the extent of compliance to ISO 25010 using disaster risk app was used. Descriptive statistics was employed particularly mean and standard deviation in order to analyze the data with regards to validity of the DSDRMIS and the assessment of IT Experts and Users. The t-test for correlated samples was also utilized to determine the significant difference between the IT Experts and Users assessments. It was found out that the disaster risk app is compliant to ISO 25010 in terms of Functional Sustainability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability and Portability. Moreover, a positive feedback towards DSDRMIS was also drawn from the respondents.

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## An Analysis of College Students’ Learning Assessment in Different Backgrounds of High Vocational Education

**Huang Yu-Che, Wu Chun-Kuan and Wu Pei-Rong**  
Chaoyang University of Technology, Taiwan

Abstract—The purpose of this study is to examine the effectiveness of different high school and vocational students in their educational learning and to further explore the differences in the development results of students in the college of industrial design at the present stage in the wooden bamboo craft course, and to present conclusions and suggestions for different educational backgrounds. Therefore, this study is divided into two parts. The first part is through the literature, to understand the existing high school education development profile, including the subject introduction, educational goals, curriculum planning, future development and so on. The second part analyzes students’ actual learning outcomes through interviews with experts through the development achievements of students in the Department of Industrial Design to understand the differences between students at the university level and the background of high school and vocational education. The results of this study found that students in higher vocational
## ABSTRACT

Backgrounds had a professional foundational technology in the college-side wooden bamboo craft course, and students in the high school background had a positive learning potential in the college-side wooden bamboo craft course.

**J092**

**15:00-15:15**

**Digital Bauhaus’ Exploration and Analysis**

Haibin Dong, Wei Wang and Zilu Wang

Xi’an University of Technology, China

Abstract—The basic education teaching system based on the “three major composition” has made important contributions to the basic education of modern Chinese design. With the continuous development of the society, especially in the 21st century, which is mainly based on information, the disadvantages of the basic course education based on the “three major composition” are increasingly evident. This article retrospective studies the basic Bauhaus course that had a profound impact on the world, analyzes its development trend, proposes the concept of “Digital Bauhaus” and conducts a preliminary analysis according to this concept.

**J099-A**

**15:15-15:30**

**Autonomous Agents’ Cognitive Model in Virtual World as Foundation of Pedagogical Situations for Immersive Intelligent Tutoring System**

Jun Seong Choi and Jong Hee Park

Kyungpook National University, South Korea

Abstract—The diversity and fidelity of numerous concurrent events comprising situations determine the quality of pedagogical experience in situations and consequently the effectiveness of immersive learning based on our simulated world. Each pedagogical situation in our virtual world unfolds across multi-agent events, which could be coincidentally inter-coupled into emergent situations. Those agents initiate and perform their respective event plans continuously adjusted to varying conditions in the background world. We design all those autonomous agents to be with their individual belief on the background world they coinhabit. The background world, and situations as its semantic units, are uniformly described in terms of entities, its interrelationships, and multi-layered occurrences. We develop a sophisticated ontology and various multi-layered, multi-dimensional knowledge representation schemes to be collectively used as each agent’s epistemic model and as the omniscient representation of the background world. Beliefs on physical and conceptual aspects of the virtual background world can be acquired through direct experience (i.e., partial observation with their own senses) or indirect experience of already abstracted knowledge from another agent. The pieces of information continuously acquired by each agent are combined with case-based reasoning and various inferencing rules such as modus ponens, syllogism, contraposition, for diverse identification or enhancement of their knowledge. Individual agents’ belief is abstracted.
ABSTRACT

According to their respective experiences and cognitive models along with values and other traits. Naturally, each agent’s belief cannot avoid being limited and erroneous, leading to epistemic discrepancies and misconception in its behavior, another major source of situation variability. This incessantly-updated, individualized belief enables autonomous and independent agents to behave both reactively and proactively against emergent situations. Our simulation model of autonomous agents along with the background world affords the highest diversity and fidelity of simulated pedagogical situations vital for immersive intelligent tutoring systems. The viability of our model has been demonstrated with its implementation against typical situations.

The Production Process of Bilingual Courseware at the National Institute of Education for the Deaf

Bruno Galasso and Dirceu Esdras
Instituto Nacional de Educação de Surdos, Brazil

Abstract—This article aims to present several stages of bilingual courseware production of National Institute of Education for the Deaf (INES), analyzed in its theoretical and technical aspects (pre-production, translation and post-production) with the principles’ description of the multimedia learning linked to the conception of bilingual digital objects designed by Online Education Center (NEO). Since, nowadays, there is few in what concerns bilingual courseware available for deaf education, we intend to contribute setting essential quality parameters to this kind of production. In this paper, 15 stages of work flow are presented to NEO’s bilingual courseware production, among them stands out the role of interpreter-translators team, who take turn as presenter-translator, supervisor-translator and revisor-translator. Besides, it is highlighted essential principles of multimedia learning on what refers bilingual courseware design. Thus, we conclude that references of multimedia learning linked to the guiding principles of deaf education create a possible line of courseware design, with innovation and interdisciplinary methods, that lead to a knowledge deepening able to contribute to the qualitative expansion in bilingual courseware production in Libras/Portuguese language.
< October 27 Afternoon >

Session II

Teaching and Management

14:30-15:45
Room 2

Chaired by: Prof. Silvio Carvalho Neto
Centro Universitário Municipal de Franca - Uni-FACEF, Brazil

Presentations: J102; J129; J3001; J107; J044

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time
## ABSTRACT

### J102 14:30-14:45

**Learning Logic Through Computer-Based Games**

**Rosalie C. Leal, Kelvin Kris Gonzales and Allan R. Leal**

**ISABELA STATE UNIVERSITY, Philippines**

Abstract—A computer-based game (CBG) as a potential learning tool in teaching is indispensable in the life of the 21st millennium learners. This study is an added literature to the development and validation of computer-based games as a learning tool. The respondents of the study include faculty members and students of Isabela State University. The methodology which included the validation of the quiz scores using paper and pencil and computer-based games method was used. Descriptive statistics was employed particularly mean and standard deviation in order to analyze the data with regards to validity of the CBG and the students' feedback. The t-test for correlated samples was also utilized to determine the significant difference between the paper and pencil scores and computer based-games scores. It was found out that the computer-based games are valid in terms of education and playability attribute and therefore, are good materials in learning logic. Moreover, there was a significant difference between the Computer-based games and Paper and Pencil scores of students and a positive feedback towards CBG were also drawn from them.

### J129 14:45-15:00

**Key Attribute for Predicting Student Academic Performance**

**Sachio Hirokawa**

**Kyushu University, Japan**

Abstract—Predicting student final score from student’s attributes is an important issue of learning analytic. Not only to achieve high prediction performance but also to identifying the key attributes is an important research theme. This paper evaluated exhaustively the prediction performance based on all possible combinations of four types of attributes -- behavioral features, demographic features, academic background, and parent participation. The behavioral features are given as numerical data. But, we represented them as pair of an attribute name and the value. This vectorization yields 417 dimensional data, while naively represented data has 68 dimension. By applyig support vector machine and feature selection, we obtained the optimal prediction performance, with respect to feature selection, with accuracy 0.8096 and F-measure 0.7726. We confirmed that the behavioral feature is so crucial that the accuracy reaches 0.7905 without other features except behavioral feature. The combination of behavior feature and demographic feature gained F-measure 0.7662.
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<tr>
<th>Time</th>
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<th>Institution</th>
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<tr>
<td>J3001 15:00-15:15</td>
<td>Research and Practice of Promoting the Professional Cultivating Ability in Higher Vocational Colleges by Ternary Construction</td>
<td>Chen Gangtian</td>
<td>Dongying Vocational Institute</td>
<td>Abstract—Training of professional ability is an important attribute of vocational education, and professional training ability is a key factor to realize this attribute. Professional training ability covers many aspects such as teaching staff, practical training conditions, curriculum system, teaching methods, and practical teaching in vocational education. Practice has proved that it is difficult to realize the goal of vocational ability training through the construction of the school itself. The participation of social forces, especially employers, is particularly important. However, it has been an indisputable fact that the employers have no intention or difficulty in deeply participating in the school education for a long time. The co-construction of higher vocational colleges, employers, and educational institutions is a new type of cooperative school-running model that can make social forces participating in the whole process of higher vocational education and effectively improve the professional training ability and students' training quality for students, laying a good foundation for career development of students.</td>
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<td>J107 15:15-15:30</td>
<td>Effective Use of Learning Management System for Large-scale Japanese Language Education</td>
<td>Yuka Kataoka, Achmad Husni Thamrin, Jun Murai and Kotaro Kataoka</td>
<td>Keio University, Japan</td>
<td>Abstract—As a mode of Japanese language education, a spoken Japanese course without Japanese characters (Hiragana, Katakana, Kanji) for reading/writing is a promising option to attract more Japanese learners with easier beginning to make. However, existing language teaching methods, even using ICT, suffer from issues of scalability and learning effect when deployed in a large-scale spoken language class. This paper proposes to effectively use Learning Management System to improve the scalability, efficiency, and effectiveness of Japanese language and culture education. The course using LMS is practiced and evaluated in an actual large-scale Japanese language class with more than 100 students in an overseas university. The proposed LMS 1) enables individual monitoring and feedback mechanism of each student, 2) visualizes the learning progress and achievement, and 3) provides a comprehensive User Interface to manage online homework and exams. To the best knowledge of the authors, the use of LMS in a large-scale spoken Japanese class has not been well studied. The evaluation results exhibited the load reduction of course management and the various benefit of LMS, which natively digitizes the contents management and can increase the students’ engagement in the class.</td>
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Abstract—In Japan, all high school students will study programming in the next teaching guidelines. It is important to use suitable environment or tool for programming education. Some current textbooks show programs written in JavaScript and instruct students to use a text editor and browser as development environment. But such environment has some problems; it requires students to manage multiple applications, to find errors with little information and to type long statements. We developed “Bit Arrow”, an online programming environment. The environment helps students to find errors. Also the environment provides API to write statements shortly. In this report, we describe design and evaluation of Bit Arrow from students' log data.
< October 27 Afternoon >

Session III

Course Design and Classroom Learning

13:30-15:15
Room 3

Chaired by: Prof. Tae In Han
Korea National Open University, Korea

Presentations: J058; J108; J2012; J127; J3006; J094; J083

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
| Session | Title                                                                 | Authors                                | Abstract                                                                                                                                                                                                                                                                                                                                 |
Evidence for Dosage and Long-Term Effects of Computer-Assisted Instruction

Haya Shamir, David Pocklington, Kathryn Feehan and Erik Yoder
Waterford Research Institute, USA

Abstract—While computer-assisted instruction (CAI) has been shown to positively impact learning outcomes in the short-term, longitudinal research has demonstrated that gains diminish with time. It is important for research to demonstrate that this increasingly prominent technology is preparing young students for successful scholastic careers. The current longitudinal study explored the long-term impact of a CAI program on young students’ literacy skills. Elementary school students (N = 1,704) who received a CAI program were tracked through kindergarten and first grade during the 2015-2016 and the 2016-2017 school years. The Developmental Reading Assessment (DRA) was administered to students at the middle and end of the 2016-2017 school year when students were in first grade. Scores of students who used the CAI program only during kindergarten (for one year only) or in kindergarten and first grade (for two years) were compared to scores of students who received traditional, teacher-directed classroom instruction and not the CAI program. Analysis indicated a salient and persistent effect of CAI: One year after students stopped using the program, students who used the CAI program only during kindergarten (for one year only) significantly outperformed students who did not use the CAI program. Additionally, evidence was found for a dosage effect: While all students who used the CAI program had significantly higher end of year scores than students who did not use the CAI program, the largest effects were found for students with high CAI usage. The findings of the current study extend prior research which had found that better results within a single school year could scale with increased use of CAI. Given the evidence found for both a lasting benefit and a dosage effect, the current study endorses the sustained use and early implementation of CAI.

Designing and evaluating three chatbot-enhanced activities for a flipped graduate course

Weijiao Huang, Khe Foon Hew and Donn Emmanuel Gonda
The University of Hong Kong, Hong Kong

Abstract—The purpose of this study is to discuss the implementation and evaluation of chatbot in a flipped graduate course run by the University of Hong Kong. Using the IBM Watson system, three chatbot activities were designed: (a) the first chatbot as a
ABSTRACT

A multiple-choice guide for learners' knowledge exploration; (b) the second chatbot as a case study facilitator for new information elaboration; and (c) the third chatbot as a bibliographic tutor to answer learners' FAQs related to the learning contents. All three chatbot activities were implemented as pre-class activities, combining with video lectures and online quizzes. Participants interacted with the three chatbots via the course web for an average of 20 minutes. After that, the participants completed a questionnaire and interview to yield insights related to their perceived social presence and interpersonal attraction about the chatbot. The findings of this study will help instructors gain valuable insights about students' attitude toward the three types of chatbot activities, the content of students' chatbot interactions, as well as recommendations for improving chatbot use in a flipped course.

A study on digital ability change after the smart worker education of the prime-aged learner

Mariah PARK and Tea In HAN
Korea National Open University, Korea

Abstract—Lifelong learning organization have been accomplishing computerization education for prime-aged learners in Korea. In early days, it started from computer literacy education, and it carried over information utilization, internet utilization, smart-phone utilization, video production, and SNS utilization. This study aimed to the ability improvement for information utilization change of the prime-aged learners after smart worker curriculum learning, the education program carry out smart worker education differentiated from the existing computerization education by prime-aged learners who faced to the smart working era. Therefore, this study chose prime-aged educational program in progress throughout one of the lifelong learning organization of the Gwangju area in Korea. This curriculum was designed by the smart worker ability subjects, it included ability for documentation, smart ability for apparatus utilization, ability for collaborative work, information management ability for cloud utilization that was a basic ability of smart working.

It was performed from the questionnaire survey to the statistical analysis about the factor of ability for documentation, smart ability for apparatus utilization, ability for collaborative work, information management capability for the learners who learned this class.

As a result, ability improvement for information utilization appeared significantly in all factors of cloud utilization, smart apparatus utilization, documentation, collaborative work, and information management after learners completed education
| J094 | 14:45-15:00 | Flipping Introductory Programming Class: Potentials, Challenges, and Research Gaps  
**Saleh Alhazbi and Osama Halabi**  
Qatar University, Qatar  
Abstract—This paper discusses the suitability of adopting flipped classroom model as instructional method to teach introductory computer programming courses at higher education. It explores how the potentials of this model can be used to address the reasons of difficulties of learning computer programming. However, adopting flipped classroom has some challenges, so the paper reviews these challenges in order to be considered when planning to implement this model. Finally, the paper presents some research gaps that need to be investigated in order to improve the practice of this model and to avoid any disadvantages when implementing this model in computer programming courses. |
| J083 | 15:00-15:15 | Developing educational ontology: a case study in physics  
**Jizhi Chen** and Junzhong Gu  
East China Normal University, China  
Abstract—Nowadays, e-learning systems are widely developed. With e-learning, students can learn different subjects remotely, and teachers can edit online teaching scripts and issue online courseware. But complain is ceaseless, that is either students or teachers are not satisfied with the existing state of affairs. The reason is that they expect that students can master knowledge architecture of required subjects, but current scattered courseware lacks systematicness. How to describe knowledge architectures of subjects, e.g. in K12, and help students to master them? Ontology can be used to efficiently present knowledge architecture of different subjects, such as Physics. A big challenge is how to construct educational ontology to describe systematic knowledge of subjects automatically. In this paper educational ontology is as a new topic discussed. An approach to automatically constructing educational ontology is proposed to convert textbook into a corresponding Ontology, with High School Physics as an example. |

Coffee Break  
15:15-15:30
Session IV

Educational Theory and Method

15:30-17:00
Room 3

Chaired by: Prof. Cecilia Goria
University of Nottingham, UK

Presentations: J093; J1004; J100; J066; J2008-A; J3004-A

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
### J093 15:30-15:45

**Using Stop-Motion Video as Visual Indicator to Strength Children with ASD’s attention Focus on specific Nonverbal Social Cues to enhance Perception**

I-Jui Lee  
National Taipei University of Technology, Taiwan

Abstract—Autism spectrum disorders (ASD) are characterized by a reduced ability to understand the emotional expressions on other people's faces. Increasing evidence indicates that children with ASD might not recognize or understand crucial nonverbal behaviors, which likely causes them to ignore nonverbal social cues, like facial expressions, that usually aid social interaction. In this study, we create a Stop-Motion Video (SMV) material for children with ASD that will catch their attention by signaling through body gesture movements and facial expressions. The participants will draw these social cues into a storyboard in which the therapist can be able to deduce patterns of judgment and awareness of the situation. This strategy provides a specific elements in a video clip let the autism can find and compare same images occur in the dynamic videos; thus, it can be used to help children with ASD increase and drive their attention toward the meaning and emotional value of facial expressions in specific social situations. The study was carried out according to multiple baseline design across participants. After five weeks of training intervention, all 4 participants’ scores rose significantly and dramatically during the intervention phase, and remained significantly higher in the maintenance phase than at baseline. The results showed that SMV strategy moderately effective in teaching the children with ASD to focus on target social signals.

### J1004 15:45-16:00

**A Preliminary Study in The Need of Designing and Implementing Technology Coaching Programme**

Anandraj Govindaraj and V.S.Giita Silverajah  
Jalan University, Malaysia

Abstract—In this age of rapid technological advancement, educators are compelled to use numerous technology tools to improve their teaching strategies and learning processes. These allows educators to be more inclusive of different types of learning styles and address the varying needs of students. Contrariwise, many studies found educators struggle to incorporate technology into their instructions in an effective way. This is because traditional professional development which takes places as a short term training, rarely results in a significant change in educators’ practice. Hence, this paper reports a preliminary study to inform the implementation of a coaching model to support educators' use of technology in their classroom. This study employs a mixed-method approach which investigates the technology integration barriers that
ABSTRACT

Educators faced, as well as, the frequency and level of technology used for teaching and learning. The participants of this study were 34 educators from Australian Matriculation (AUSMAT) programme at Sunway College, Kuala Lumpur. The findings of this study showed that very few educators integrated technology at the transformation level of Substitution Augmentation Modification Redefinition (SAMR) model. Additionally, time limitation, lack of support and training, lack of confidence, subject nature and resistance to change are some of the barriers that resulted in the low-level technology integration in classrooms. Further, this study provides insights in the development of a coaching model in encouraging and growing expertise among educators in classroom technology implementation.

Initial Consideration on Designing a System to Support Science Communication and Continuous Programming Learning

Yuki Kiridoshi, Ken Ishibashi, Kazutake Kozono and Ichiro limura
Prefectural University of Kumamoto, Japan

Abstract—Since computers are used everywhere in the current society, it is important that science communication is implemented actively. In addition, it is also important that people actively participate in this and deepen their understanding of science. However, few studies have been done to deeply explore the mechanism of the secondary and tertiary derivation of science communication. Furthermore, programming education has attracted attention as a means of learning computational thinking for every child living in an information society. However, even though children are interested in programming and computer science, the continuous framework of programming education is insufficient. And there is room for consideration about mechanisms and systems that encourage the derivation of science communication in computer science and support continuous learning. In this research, in order to solve the above problems, we have designed and evaluated a cloud-based system that is a place of science communication and support programming learning, exceeding distance and temporal constraints. As the result of research, the proposed system in this paper intended the potentials of promoting the derivation of science communication and supporting continuous programming learning. However, there is room for improvement of the system design and the verification in detail.

A Generic IoT Architecture for Ubiquitous Context-Aware Assessments

Salsabeel Shapsough and Imran Zualkernan
American University of Sharjah, United Arab Emirates

Abstract—Ubiquitous learning environments move learners out of a classroom and into the real world, where learners can engage in experiential and tangible learning.
These environments setup peer-to-peer networks where learners, teachers, and objects of interest can take part in creating learning scenarios. A key component of such systems is a wireless-enabled edge device augmented with various types of sensors to represent the state of physical objects and environments. Most such current systems are built using traditional Internet technologies that often lead to cumbersome, unreliable, and overly complex designs. This paper presents a novel generic technical architecture for ubiquitous assessment systems based on the Internet of Things (IoT) computing paradigm. A commonly used IoT edge device was used to implement four variants of the proposed architecture. The variants were based on Advanced Message Queuing Protocol (AMQP), Constrained Application Protocol (CoAP), Message Queue Telemetry Transport (MQTT), and Extensible Messaging and Presence Protocol (XMPP). The four architectural variants were evaluated in terms of power consumption and CPU utilization as the system changes in scale. The variants were also evaluated under various network conditions in order to assess their effect on response time, which in turn influences the user experience. The evaluation revealed that while the MQTT-based implementation demonstrated a consistent, generally-better performance, in practice, all variants of the architecture have a similar resource footprint for this class of applications. Hence, an implementation of the proposed architecture using either of the four protocols is expected to enhance the learning experience by capturing the benefits of ubiquitous and context-aware learning at a low cost, making it ideal for resource-constrained learning environments.

Using technology for student support in distance education in a developing country

**Matshepo Matoane** and Lekau Rachidi
University of South Africa, South Africa

Abstract—In distance education, student support plays a critical role in bridging the transactional distance that results from the spatial distance that exists between learners and their institution (and by implication) their instructors. According to best practice, such support has to be intentional and well planned to provide cognitive, emotional and institutional support to students (Tait, 2000). The affordances of technology offer opportunities for reducing the distance in distance education as well as mediating a feeling of isolation, which tends to resonate with most students who learn and study through distance education.

In this presentation, we reflect on an intervention that was introduced at a distance
education institution in a developing country, in Africa, to primarily provide students with support towards their teaching and learning. The intervention entails increasing opportunities for access to technology for our students who primarily reside in remote and peripheral areas of the country, where there is a limit and scarcity of resources. The dynamics of operating technology in rural locations, in a developing country, are explored and discussed, including their impact on epistemological access. The presentation concludes by providing consideration points for integrating technology into supporting students' teaching and learning in developing countries.

A COMP-PLETE experience for Distance Learning

Cecilia Goria
University of Nottingham, UK

Abstract—The purpose of this contribution is to present and discuss a pedagogical model in which sense of community, participation and openness feature as highly significant in shaping a distance learning educational experience.

The model was develop inside an online professional development programme at Master's level, which targets qualified teachers interested in developing their theoretical and practical expertise in the field of digital technologies for the teaching and learning of foreign languages.

The overarching design of the programme complies with guidelines delineated by the cognitive and experiential approaches to course design as portrayed in Toohey’s (1999) typology; it promotes a combination of constructivist and experiential learning to define the role of content knowledge, teachers, learners and their interactions.

The pedagogical model, named here as COMP-PLETE, was developed by combining (Konstantinidis and Goria 2017, Goria and Konstantinidis 2017) principles of the Community of Inquiry model (Garrison et al 1999), features of the Community Indicator Framework (Galley et al 2014) and the notion of Personal Learning Environment (Attwell 2007).

The outcome is a highly participatory model of online teaching and learning which, based on the synergy between nine features – community, openness, multimodality, participation, personalization, learning, experience and technological-enhancement – provides an academic experience that empowers the learners to act as agents in determining personal learning goals, in shaping the community of practice and in informing the content and structure of the programme.

Through COMP-PLETE, challenges that are common to formal distance learning education are addressed, including the tension between the benefits of open learning and institutional needs, the tension between students’ personal and professional...
commitments and course requirements, the students’ feelings of isolation and disconnection affecting participation.

COMP-PLETE does so by cultivating, through social media, a strong sense of learners’ community within and beyond the boundaries of the programme and by increasing the learners’ commitment to the programme though personalization and participation.

In this contribution, the development of COMP-PLETE will be outlined and discussed and suggestions will be advanced for building technology-enhanced strategies to ensure the sustainability and transferability of the model.
< October 27 Afternoon>

Session V

Online Learning and Learning Environment

13:30-15:15
Room 4

Chaired by: Prof. Mizue Kayama
Shinshu University, Japan

Presentations: J050; J101; J045; J059; J112; J2014-A; J2006

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
Evaluation of a tool for Java structural specification checking  

**Anton Dil** and Joseph Osunde  
The Open University, Milton Keynes, England

**Abstract**—Although a number of tools for evaluating Java code functionality and style exist, little work has been done in a distance learning context on automated marking of Java programs with respect to structural specifications. Such automated checks support human markers in assessing students’ work and evaluating their own marking; online automated marking; students checking code before submitting it for marking; and question setters evaluating the completeness of questions set. This project developed and evaluated a prototype tool that performs an automated check of a Java program’s correctness with respect to a structural specification. Questionnaires and interviews were used to gather feedback on the usefulness of the tool as a marking aid to humans, and on its potential usefulness to students for self-assessment when working on their assignments. Markers were asked to compare the usefulness of structural specification testing as compared to other kinds of support, including syntax error assistance, style checking and functionality testing. Initial results suggest that most markers using the structural specification checking tool found it to be useful, and some reported that it increased their accuracy in marking. Reasons for not using the tool included lack of time and the simplicity of the assignment it was trialled on. Some reservations were expressed about reliance on tools for assessment, both for markers and for students. The need for advice on incorporating tools in marking workflow is suggested.

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**Salient Features of an Effective Immersive Non-Collaborative Virtual Reality Learning Environment**  

**Abadia Rhodora**, James Calvert, Syed Mohammad Tauseef  
Torrens University Australia, Australia

**Abstract**—The use of immersive virtual reality learning environments (VRLEs) is changing the way students learn and understand things. A VRLE allows its users to get immersed in the simulation, thus giving the sense of being part of the real world that it represents. Virtual Reality (VR) existed in various forms in the past two decades, but its early adoption in education was hampered by its high cost. Emergence of affordable head-mounted displays (HMD) is now making it possible to provide VR experience in classrooms. This paper aims to apply integrative review of relevant studies conducted in evaluating the effectiveness of VRLEs and in doing so reveal the existing research gaps among VRLE studies. This paper identifies salient features of a fully immersive and non-collaborative VRLEs that uses HMD. Salient
### ABSTRACT

Features were derived from evaluating different instruments used to measure the effectiveness of immersive VRLEs. A framework and example of instruments to evaluate salient features of an effective VR, using Kokoda VR as a case study, are also provided.

**Development and Demonstration of an Integrated EEG, Eye-Tracking, and Behavioral Data Acquisition System to Assess Online Learning**

**Gina Notaro** and **Solomon Diamond**

Dartmouth College, United States

Abstract—Over the past several years, there has been a rise in online learning platforms and websites for skill acquisition. However, traditional learning analytics to evaluate interfaces and the effectiveness of presented material are limited in that they do not acquire information regarding the biophysical state of the user, leaving out important metrics regarding an individual’s ability to learn and remember. In this paper, we propose an inexpensive system for evaluating online learners’ engagement and performance via electroencephalography (EEG), eye-tracking, and behavioral data methods. Such information is of interest to educational neuroscientists and psychologists aiming to quantify online learning processes and developing models to represent learning states, as well as to individuals designing educational content to better understand how information is accessed and utilized by users. We first describe the selection, design, and integration of these components. We then illustrate the combined utility of our system in a demonstration while participants (N=22) complete German language lessons on the free web-based platform, Duolingo. As low-cost hardware is utilized in our system, data acquisition can readily be scaled to multiple research sites or setup within the home, allowing for access to more naturalistic datasets not typically studied using traditional laboratory research systems.

### J045
**14:00-14:15**

**A Study on Factors Hindering Online Learning Acceptance in Developing Countries**

**Solomon Oluyinka,** **Mercy Ejovwokeoghene Ogbari** and **Anatalia N. Endozo**

Angeles University, Philippines

Abstract—Advents of online learning and its applications have given tertiary-organizations a better operating system to broaden their educational system via internet which offers students with flexibility and ubiquity to embrace online-learning innovation anywhere and at any time. Regrettably, in developing countries, least studies have been conducted to explore the factors conducive to learners’ acclaimed versatility regarding online learning. This study employed technology acceptance model as a groundwork in examining objection of online-learning. Partial least squares(PLS) structural equation modeling utilized to
analyze the 869 responses of students studying in four tertiary institutions that permitted for this learning mode in Nigeria. Hypotheses tested on power supply, technical resources, perceptive usefulness and ease towards behavioral intents of students to adopt online learning in Smartpls engine supported in this study, expect ease of use on behavioral intents to accept the system failed. All regressed significant at p-value < 0.003, and a variance explained of 75% of factors achieved in this study. However, supported factors in the Nigeria context may not in countries, because of some cultural differences and technology readiness. Thus, recommended the replication of this study to increase the generalizability of this result achieved.

Can Learner Characteristics Predict their Behaviour on MOOCs?
Alexandra I. Cristea, Mohammad Alshehri, Mizue Kayama, Jonathan Foss, Lei Shi and Craig D. Stewart
Shinshu University, Japan

Abstract—Stereotyping is the first type of adaptation in education ever proposed. However, the early systems have never dealt with the numbers of learners that current MOOCs provide. Thus, the umbrella question that this work tackles is if learner characteristics can predict their overall, but also fine-grain behaviour. Earlier results point at differences related to gender or to age. We have also looked into more details into finer-grain analyzing the weekly behavior of females and males. Here, we further expand this, by showing how, depending on the way the comments are counted, significance can be found when comparing female and male commenting behavior, at the level of the week. Moreover, the topic of the course is an important factor in this behavior. These outcomes can help in informing future runs, in terms of potential personalised feedback for teachers and students.

Learner’s perception and experience on learning in online environment using e-textbook
Sunghye Lee, Kyoungae Choi and Yoojeong Chae
Korea Advanced Institute of Science and Technology, South Korea

Abstract—Various researchers focused on the preference of e-textbooks and the reading and learning effects of e-textbooks. However, there is little research on the in-depth learning experience using e-textbooks. Particularly, previous researches recognize the positive side effects of e-textbooks, however, they failed to discuss the actual relationship between the learning process and its application. This research tried to show grounded theoretic approach on how students in middle schools and high schools achieve learning experience using e-textbook.
Ninety students who enrolled in an online mathematics and science learning program
ABSTRACT

and actively participated were interviewed for this study. Interview data were analyzed based on the grounded theory (Strauss & Corbin, 1988).

As a result, online learning environment can be conceptualized in 3 different attributes that are time-based, spatial, and technical. Categories of students’ perceptions on e-textbook are time attributes, space attributes, technology attributes.

First, anytime access, learning schedule management, self-adjustment of learning time, time saving are part of the category time-based attributes. Learning material arrangement, search & navigating, interaction, and information processing are part of the category spatial attributes. Nonlinear accessibility, stability, multitasking, data utilization, and limited function are part of the category technical attributes. Such learning environment was able to provoke self-directed learning, extended learning, interactive learning, in-depth learning, improved ICT literacy, and formation of positive emotions and learning habits. Most of the learners showed positive feedbacks towards the e-textbooks, while some mentioned the technical limitations such as equation, graph, and problem solving compared to conventional paper-based learning.

Throughout the research, it was shown that self-directed learning was most affected by the e-textbook based learning.

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Game-Based Learning for Young Learners

Haya Shamir, David Pocklington, Kathryn Feehan and Erik Yoder

Waterford Research Institute, USA

Abstract—Kindergarten, first grade, and second grade students used a computer-adaptive game-based learning (GBL) curriculum during the 2016-2017 school year. Students with high usage of the GBL curriculum significantly outperformed students with low usage on all end of year literacy scores, and students who used the GBL curriculum significantly outperformed students who did not use the curriculum on all end of year literacy scores as well. Students who used GBL curriculum also outperformed their control counterparts across demographics. These results indicate the GBL curriculum potentially positively impacts early literacy skills. These results indicate that more impactful studies concerning incorporating GBL curriculum in conjunction with traditional, in-class literacy instruction are necessary.

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Coffee Break

15:15-15:30
Session VI

Gamification Teaching and Innovative Technology

15:30-17:00
Room 4

Chaired by: Prof. Ingrid Fonseca
UNIMINUTO, Colombia

Presentations: J038; J065; J081; J097; J019; J2005

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<tr>
<td>J038</td>
<td>The Innovative Didactic Labs of the Iscol@ Project</td>
<td>Carole Salis and Fabrizio Murgia</td>
<td>Abstract—This paper offers an overview of Line B of the Tutti a Iscol@ project, a 3 year program financed by the Regional Sardinian Authority through European Social Fund (ESF): POR FSE 2014-2020 to fight student disengagement through extracurricular activities based on Information and Communication Technology (ICT). The project is based on constructivism and experiential learning. The age range of participating students is 8-20. Technologies were selected for their educational potential. The project involves three actors: the Institutions that produced the guidelines for the creation of extracurricular technological labs and financed the related call for proposals; the Economic Operators (EO) that submitted their original proposals for extracurricular lab activities and the School System as final recipient. We illustrate the key points of Line B, the methodology followed, and give some clues on the results obtained.</td>
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<td>J065</td>
<td>A Case Study of Using gamification to Improve Art Education in College Class</td>
<td>Wei Wang and Jingjing Lv</td>
<td>Abstract—Gamification is the application of game-design elements and game principles in non-game contexts. The core concept of gamification is to apply elements and principles of game design to non-game areas to make certain activities more engaging. Education, with its strong interactivity, fierce competition among individuals/groups and challenges in high difficulties, which has lots of similarities with game, are supposed to be the most widely used areas of gamification. The author has 8 years of game designer experience and use specific game theory to design a set of gamification method for college class teaching. After practice, the result shows that it can significantly improve study enthusiasm, satisfaction for lecturers and teaching effect.</td>
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<td>J081</td>
<td>Effect of Instructor Inclusion type and Subject Complexity on Students’ Learning in Lecturer Video</td>
<td>Jianxia Cao, Akinori Nishihara and Shijuan Wang</td>
<td>Abstract—Instructional contexts using slideshow and lecturer video are reported to be more engaging and appealing to students compared than context without instructor’s video. But to which proportion instructor’s inclusion should take in the instructional video still remains unknown. This study examined students’ perceived</td>
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instructor’s presence (SPIP) and satisfaction using two types of instructor’s inclusion, combining with two learning courses at different complexity levels. Explanatory Factor Analysis was done for students’ perceived instructor’s presence, three factors were identified, sense of connection, usefulness for clear-clarification, helpfulness for assisting-understanding. MANOVA analysis showed that there was interaction effect for students’ perceived satisfaction between course complexity and the type of instructor inclusion. For bigger instructor inclusion, students’ perceived instructor presence was higher for more complex learning course. For easier learning course, students’ satisfaction was higher for smaller instructor inclusion. This preliminary finding provides hints for instructional video designers and facilitators.

Design and Development of Online Practice Teaching Platform of New Information Technologies

Yong Wang, Xiaorong Zhu and Zhanmin Yang
Nanjing Institute of Industry and Technology, China

Abstract—The information technology promotes the reform of practical teaching in universities. China has gradually become a country of great power of education, and the trend of internationalization of education is strengthened. It is an inevitable trend to achieve international certification of higher education or higher vocational education. For meeting the requirements of training of new information technologies, this paper has designed and developed an online practice learning platform, which has realized the "student centered" teaching activities and transformed the teaching process from "result verification" to "process understanding". The practice results show that the platform can achieve personalized learning of students and improve learning efficiency.

A study for Object-Oriented Modeling Method in Graphic Design Teaching

Huang Yu-Che, Huang T.S and Huang Ying-Jie
Chaoyang University of Technology, Taiwan

Abstract—Designers use parametric software to make design changes to parts with multiple similarities but different sizes, they need to enter and leave individual units from time to time for numerical adjustments, and repeated adjustments often take a lot of time. There will also be many mistakes due to user negligence. In this study, parametric drawing software was used to draw the model. Using the general basic view method and the parametric drawing software itself to refer to each other, a set of drawing methods was designed and a sleeve was used as an object-oriented paradigm. This study allows the tester to use parametric drawing software to construct the model indicated on the drawing surface. Then, the model drawn by the tester and the
model drawn by this study are subjected to five design changes in accordance with the item size indicated on the design change chart. To discuss the time and error rate that the two need to spend when making design changes. This study found that the mapping methods designed in the study had significant differences in the number of errors and the time taken for design changes in each group of experiments. It is hoped that this study will explore the modelling method that considers subsequent design changes as a starting point when constructing the model. It hopes to provide the campus as a teaching tool to achieve the student's future connection with the industry, and to provide for the design of relevant industries. In terms of design modeling thinking, it is another way of thinking and creating designs.

Improving Early Literacy Skills Using Technology at Home

**Haya Shamir**, Claudia Miner, Ann Izzo, Kathryn Feehan, Erik Yoder and David Pocklington

Waterford Research Institute, USA

Abstract—This study explored the impact of a computer-adaptive reading curriculum on the literacy skills of young learners in pre-kindergarten. Pre-kindergarten students were randomized into either a computer-adaptive reading (experimental) condition or a computer-adaptive math and science (control) condition. Students used their respective programs at home in thirteen of the most rural school districts in Utah. The Waterford Assessments of Core Skills (WACS) was administered at the beginning and end of the program to assess students’ literacy skills across multiple strands. At the conclusion of the program year, students who used the computer-adaptive reading program significantly outperformed their control counterparts on Overall WACS scores; furthermore, students who used the computer-adaptive reading program outperformed their control counterparts on literacy strands of the assessment. The improvement was seen across demographics, including socioeconomic status, whether students attended another preschool, ethnicity, and active special education status. These findings indicate that the computer-adaptive reading program improves students’ early literacy skills after one year in the program and prepares them for kindergarten.
< October 28 Morning>

Session VII

Computer Aided Teaching and Application

9:45-12:00
Room 1

Chaired by: Prof. Betsy J. Bannier
Lake Region State College, USA

Presentations: J007-A; J121; J119; J063; J071; J085; J041; J137; J1009

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<td>J007-a</td>
<td>The Use of Computer Simulation Technology to Help Students Understand Basic Concept of Inventory Management</td>
<td>Shing Chih Tsai and Min-Han Chang, National Cheng Kung University, Taiwan</td>
<td>Abstract—In this paper, we use a simulation example of inventory control system to help students understand the basic concept of supply chain management. We present a simulation-based solution framework for solving the constrained inventory control optimization problem. We use simulation software Arena to build up a multi-echelon inventory system. The system performance is analyzed using the developed simulation tool. The virtual environment allows students to analyze and improve their inventory policy alternative designs by changing variables and observing how their changes affect the system’s performance. We can clearly see that how the optimal inventory policy behaves under different parameter settings or practical scenarios. The paper shows that the instructional simulation technologies can be used to provide a fertile learning environment for students in the context of supply chain management.</td>
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<td>J121</td>
<td>Using Throwable Wireless Microphone Technology to Enhance Classroom Interaction in a Large Class</td>
<td>Pit Ho Patrio Chiu, Crusher S K Wong, Siu Wo Tarloff Im, City University of Hong Kong, Hong Kong</td>
<td>Abstract—Throwable wireless microphone is an emerging technology to adopt in a teaching environment. It aims to promote classroom interaction. In this study, we examined students’ learning experience and their perceptions regarding participation and interaction when adopted the technology in a large class setting at higher education level. Quasi experimental approach was employed to determine the impact of the technology on students. A total of 187 graduate students from a research oriented university in Hong Kong participated in the experiment. They were divided into control and subject groups. Instructor facilitated discussion questions and invited approximately half of the class to response via random selection in control group and throwing the microphone to random student in subject group. Quantitative feedbacks were gathered through two questionnaires to study their perceptions on learning experience and classroom interaction. Statistical analysis was conducted on the data and it revealed that the subject group, who was exposed to the technology, reported better learning experience mean score as compared to the control group. It was also discovered that active students in the subject group, who had actually caught the throwable microphone and talked in class, perceived significantly better classroom</td>
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**ABSTRACT**

Interaction compared to those merely sat and observed in the same classroom. The findings of this study suggested that the use of throwable wireless microphone technology indeed enhanced learning experience and classroom interaction in a large class environment. However, these positive impacts were not evenly effecting all participants. Participants who had caught-and-talked in class benefited the most from the adoption of the technology. In order to maximize the effect of the throwable microphone technology, instructors should increase the number of caught-and-talked participants in a large class setting.

| J119 | 10:15-10:30 | Researches in Educational Computer Animation and Game in Thailand  
Suwich Tirakoat  
Mahasarakham University, Thailand  
Abstract—This paper aimed to synthesize of researches in computer animation and game which published in Thai open access database between year 2007 and 2017. There were 102 researches as sample of this research, frequency and percentage were main statistics for data analysis and reported the results in form of tabulations and graphs. The results found that the number of CAG research in Thailand started had increased since 2011. The most of animation and game were 2D production and used for general education which made for primary and secondary student. Data collection used questionnaires and tests with validation test with reliability. Basic descriptive statistics were used to analysis the result of research. Major finding of this research found that animation and game were not used as teaching material in the course, and the result of research described specific group of target student. Consequently, future research in computer animation and game should impact to general student and study in multidimensional learning and more factors of education. |
| J063 | 10:30-10:45 | A Framework for Developing Programmable Low-cost Robotics Kit for Classroom Education  
Mehedi Hasan Masum, Tanvir Shahriar Rifat, Saifuddin Md. Tareeq and Hasnain Heickal  
University of Dhaka, Bangladesh  
Abstract—The purpose of this paper is to present a project that provides a framework to build educational robotics kit with low cost components and interface the kit with a visual programming language. A robotics kit is inaccessible to many third world schools due to its high cost. This paper provides a “Do It Yourself” (DIY) approach to produce graphically programmable robots with low cost components. The framework consists of the low-cost hardware components, back-end software and the visual |
A teaching scheme using forerun computing-culture cases for Computational-thinking oriented course
Yiyi Xu, Pengfei Liu and Jun Zhao
University of Tasmania, Australia
Abstract—Computational thinking (CT) ability has been described as a new training objective of basic computer courses in Chinese university. Currently, contents and methods of basic computer course teaching in college have been unable to meet the actual needs to develop CT ability. This paper firstly makes an analysis of possible reasons for the above challenge and then aimed to how to teach and what to teach in a practical way. Our research discussed the basic concept and research status of "computing culture" discussed and extracted above 60 typical cases based "computing culture". These cases focused on discovery joinery of prophetic computer scientists etc. As the main line of teaching, these cases run through in-class teaching and organize every teaching step, such as leading-in, explanation, discussion, dialogue, and conclusion and so on. The several years teaching practice prove the strategies for teaching design put forward in this study is effective to foster a student's sense of "computing" and to arouse the students' interest. The finding conclude that developing the broader value of computing-culture and continued investing in the refine of computing-culture based cases are valuable.

Understanding the Constraints to Using Social Media Platform as a Tool for Design Learning in Higher Education from Students’ Perspectives
Yun Yi Tan and Allan H.K. Yuen
Universiti Sains Malaysia, Malaysia
Abstract—This paper explores how social media could be harnessed to enhance design students’ learning experience in higher education and address the competency gap between academia and the creative industry. By analyzing the constraints to the use of social media in higher education, findings from this paper may assist instructors to overcome the challenges when using the technology for design learning purposes. This paper presents case studies of six diploma design students who have used a social media platform (SMP) that are specifically built for the community of designers –
Behance, to facilitate their design learning process. The findings are drawn upon an in-depth investigation into their uses of the SMP over a period of 14 weeks in a higher education institution in Malaysia. In general, the constraints the students mentioned referred to the technical constraints of the SMP, such as the interface design of the SMP, limited file formats, and the function of the tools provided by the platform. However, the findings also revealed that there are also other factors identified by the participants that affected their choice of using such platforms in their design learning process in the future. The major constraints are: (a) social factors, (b) conflict of learning styles, (c) time to learn and use, (d) use of languages, (e) lack of resources, and (f) security and privacy. This paper describes and discusses each of the constraints.

On Designing a Cybersecurity Educational Program for Higher Education

Eunyoung KIM and Razvan BEURAN

Japan Advanced Institute of Science and Technology, Japan

Abstract—Cybersecurity education is critical for preparing current and future IT professionals to deal with the multitude of security threats that occur worldwide on an ever-increasing scale. We believe that this issue can be addressed most effectively at the level of higher education, which provides the best balance of existing skills and available resources as needed for such highly-technical topics. In this paper we present first of all a methodology for designing a cybersecurity educational program, so that it becomes easier for all interested parties to design such programs, which helps extending the global scale of cybersecurity education. Secondly, we describe in detail how we applied our methodology to design an appropriate cybersecurity program for the case of higher education in Japan, followed by a discussion of the current state of our endeavor.

Auto-encoder based Stacked Predictor for Anomaly Detection

Xiaoyi Yu, Zhanzhong Pang and Jun Sun

Fujitsu Research & Development Center, China

Abstract—We proposed a method for anomaly detection. The architecture proposed in this paper comprises of two networks. To compress and rebuild an input, a deep auto encoder (DeAE) is utilized where low dimensional latent variables and reconstruction error can be obtained. Meanwhile multi-layer perceptron (MLP) network which takes the generated latent variables as input is established aiming at predicting its corresponding reconstruction error. By introducing MLP network, anomalies sharing similar reconstruction error yet different distribution of latent variables to normal data or vice versa can be further separated. These two networks,
DeAE and MLP are trained jointly in our model and the prediction error form MLP network is used as score for anomaly detection. Experiments on several benchmarks including image and multivariable datasets demonstrate the effectiveness and practicability of this new approach when comparing with several up-to-date algorithms.

Factors Influencing the Adoption of Education Gamification within Abu Dhabi/UAE Higher Education Institutions

Salam Hoshang, Hatem Tamimi, Heba Mohammad and Shamsa Al Swaidi
Higher Colleges of Technology CIS Department, Abu Dhabi, UAE

Abstract—The use of gamification in education contexts is increasing at a rapid pace, particularly due to its huge potential in motivating and engaging students. This study used an online survey to define the factors that influence the adoption of education gamification in Abu Dhabi. As the results suggest, the need to replace outdated learning methods, the lack of knowledge and skills, and the level of faculty support of education gamification are some of the factors identified by students as having a significant influence on the adoption of education gamification in Abu Dhabi.
Session VIII

E-learning and Multimedia Teaching

9:45-11:45
Room 4

Chaired by: Prof. Hsiu-Chia Ko
Chaoyang University of Technology, Taiwan

Presentations: J096; J118; J126; J2009-A; J062; J106; J064; J134

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
Automatic Generation of Interactive NPC Scripts for a Mixed-Reality Integrated Learning Environment

Andrew Yuan, Fengfeng Ke, Raymond Naglieri, Xin Yuan, Mariya Pachman and Zhaihuan Dai
Florida State University, USA

Abstract—virtual reality based, inclusive and immersive e-learning environment that promotes engaging and effective learning interactions for a diversified learner population. MILE uses a large number of interactive Non-Player Characters (NPCs) to represent variant research-based learner archetypes and groups, and to prompt and provide feedback for in situ teaching practice. The NPC scripts in MILE are written in Linden Scripting Language (LSL), and can be quite complex, creating a significant challenge in the development and maintenance of the system. To address this challenge, we develop NPC_GEN, an automatic NPC script generation tool that takes high-level NPC descriptions as input and automatically produces LSL scripts for NPCs. In this work, we introduce NPCDL, a language that we design for NPC_GEN to give high-level descriptions of NPCs, describe how NPC_GEN translates an NPCDL description into an LSL script, and report a user study of NPC_GEN. The results of our user study indicate that with minimal training, non-technical people are able to write and modify NPCDL descriptions, which can then be used to generate LSL scripts for the NPCs: the development and maintenance of NPCs is greatly simplified with NPC_GEN.

Innovative and Efficient Teaching Methodology for Digital Communication Systems using an e-Learning Platform

Rajeev Kanth, Jukka-Pekka Skönn, Arto Toppinen, Kari Lehtomäki, Mikko-Jussi Laakso and Jukka Heikkonen
Savonia University of Applied Sciences, Finland

Abstract—This paper studies the possibilities of employing an e-Learning platform for effective teaching and evaluation of a course on Digital Communication Systems. The platform not only provides high-impact pedagogical practices that deepen learning and foster student engagement, but is also an appropriate tool for efficient instructional methodology, accurate and transparent student evaluation, and easy implementation. The main motivation behind building the course material using the online e-Learning platform is twofold. First, to impart substantial knowledge and understanding to the students effectively; and second, to receive student performance statistics and feedback instantly at the completion of each module of the course. The adopted approach of imparting knowledge to the students utilizes an innovative and
customizable platform for efficient learning outcomes. We employed the Finnish National Board of Education system to implement the course and its evaluation procedures. At the end of the course, the students felt this to be a convenient, understandable, and efficient approach for imparting knowledge and students felt they gained more, compared to the traditional approach.

Examining the diverse field of “e-learning” and its key competencies through job postings

**Yumeng Sun**, Khe Foon Hew, Ying Tang and Donn Emmanuel Gonda
The University of Hong Kong, Hong Kong

Abstract—This study examines the various job description terms as well as key competencies associated with the field of e-learning as revealed in job postings. We systematically analyzed 53 job postings retrieved from 7 websites. The results show the current top 10 e-learning key competencies are: Content management, Collaboration skills, Website knowledge, Project management, Andragogy knowledge, Interpersonal communication skills, Pedagogy, Digital technology mastery, Oral communication skill and written communication skills. Newer competencies emerge, such as copy rights issues, mastery of programming language and data analytical skills, which bring more opportunities and new challenges to e-learning practitioners.

Transforming teaching and learning support at an open distance e-learning institution in Africa

**Matshepo Matoane** and **Elias Oupa Mashile**
University of South Africa, South Africa

Abstract—Our institution has transformed from being a purely correspondence university [that relied heavily on print technology] to aspiring to become the leading open distance e-learning institution, in its 145 years of existence. The institution has also, over the years, seen exponential growth in its student intake, with enrolments of around 350 000 students. As an institution, we emphasize the role of student support as a means to mediate not only the transactional distance but also to enhance the students’ learning experience. In this presentation, we focus on the institution’s model of supporting teaching and learning through tutoring. We unpack the model and its pedagogical underpinnings, as well as provide reflections of how its implementation has transformed the institution’s teaching and learning practices. We also share our experiences of how interdependencies such as the Human Resource Department, the Department of Information and Communication Technology, the Regional offices, academic departments, primary academic support departments and students play a critical role in ensuring the model’s success.
ABSTRACT

Web-Based Human Resource Management System Prototype for Interactive Multimedia Learning In Indonesian Vocational Schools

Anis Susanti, Wiedy Murtini and Harini Sebelas Maret University, Indonesia

Abstract—This research aimed to develop a web-based instructional medium for the subject of Human Resources Management Automation in vocational high schools. This learning medium is intended for the eleventh-grade students of Office Administration. The development process was conducted based on the Alessi & Trollip's model including planning, design, and development. However, the present study was only up to the stage of prototype design. The result of the final design was a web-based multimedia containing instructional materials about human resource management system prototype. The app was created with HTML5, CSS3, PHP5, Java Script, JQuery, and MySQL for system optimization. The developed application contains four main menu options: home, content, simulation and quiz. The usability testing score from 9 students’ response in overall showed 79.6%. It meant the web of human resource management system was usable for users in the classroom.

Exploring the Factors Driving Impulse Buying Tendency on Advertisements of Facebook: A Social Learning Theory Perspective

Hsiu-Chia Ko

Chaoyang University of Technology, Taiwan

Abstract—Nowadays, advertising on Facebook has grown into a highly popular marketing channel, resulting in how advertisements can capture users’ attention becomes a vital issue for practitioners and researchers. This study aims to use the Social Learning Theory as a theoretical foundation to investigate how the social-feature factor, perceived herd behavior on Facebook advertisement, may serve as the external observational learning sources and how personal instant gratification need learned from impulse consumption may serve as the internal reinforcement learning sources. Moreover, how both learning sources tempt consumers’ impulse buying tendency was also examined. The results showed that the numbers of “Like,” “Share,” and “Comment” on the advertisement of Facebook might become an effective observational learning source that triggers users to follow and imitate others’ advertisement viewing behaviors. The results also indicated that instant gratification feeling learned from previous impulse buying can be a reinforcement learning source that becomes a durational inner stimulus of impulsive consumption. Moreover, this study further revealed that both perceived herd behavior and instant gratification would lead users to generate reactions of perceived usefulness and perceived
enjoyment toward advertisements on Facebook News Feed, which in turn intensify their impulse buying tendency. Notably, both perceived herd behavior and instant gratification have greater influences on perceived usefulness than on perceived enjoyment, and perceived usefulness also has a greater influence on impulse buying tendency. Finally, the implications of the results were discussed.

Mobile Application Based Multimedia: A Design of Accounting Instructional Media for Vocational High School (VHS)

Vivi Pratiwi, Siswandari, Djoko Santosa Th
Sebelas Maret University, Indonesia

Abstract—This study aims to answer the needs of the development of instructional media in accordance with the development of technology in order to provide a direct and meaningful learning experience for accounting students in Vocational High School (VHS). The design of instructional media is based on 4D model (Define, Design, Develop, and Disseminate). This type of research is research and development (R&D) using eleventh grade students of accounting in VHS in Indonesia as the subject of research. Data were obtained using observation, survey, and interview techniques. The results show that technological advances and available facilities have not been used optimally in accounting learning in VHS. Though the curriculum requires the use of technology in learning that is supported by the ability of students in operating various technology-based instructional media. Surveys also show that all students have mobile phones that can be used to access information. In addition, students want practical, interesting, and fun learning through the development of appropriate instructional media. Therefore, in this study want made the design of instructional media in the form of mobile application based multimedia. This medium is accessible on a student’s personal mobile phone designed with an eye-catching look with a blend of fun materials, simulations, and games. Thus, expected to provide the appropriate instructional media in accordance with the needs of accounting learning in VHS.

What can social media benefit student teachers in?

Shih-Hsiung Liu
National Changhua University of Education, Taiwan

Abstract—According to literature review, student teachers often encounter problems regarding teaching-related practices, anxiety on practicum, and interpersonal relationships with school personnel. Social media can provide information and support. The purpose of this study is to investigate what social media can benefit student teachers in. A Facebook Group for Taiwanese interns was built. A quasi-experimental pre- and post-test control group design was employed among
student teachers. The analysis of the validated questionnaires consisted of 105 in E-Group and 40 in C-Group. This study concludes that social media use benefited student teachers in decrease of teacher anxiety on practicum; however, the use cannot promote their pedagogical content knowledge, neither strengthen their interpersonal interaction with school personal.
< October 28 Morning>

Session IX

Computer Aided Teaching and Application

9:45-11:00
Room 3

Co-Chaired by: Prof. Matshepo Matoane
University of South Africa, South Africa

&

Dr. Fang Lou,
University of Hertfordshire, UK

Presentations: J060-A; J021-A; J011; J005; J091

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<th>Visualizing math inequalities by paper craft and mixed reality</th>
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<tr>
<td></td>
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<td>Kazuhisa TAKAGI</td>
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<td>Kochi college, National Institute of Technology, Japan</td>
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<td>Abstract—In colleges of technology almost all students own notebook PC, tablets, or smart phones. The author is a mathematics teacher of a college of technology. Students have some difficulty to understand math inequalities. Proofs of inequalities are made algebraically in usual. The author found two ways to visualize math inequalities. One of them uses the latest technology mixed reality. Mixed reality is a merging of two worlds: the real one and a virtual one. It is used in many fields such as manufacturing industry, medical, building, apparel, tourism, etc. In education, some teachers use mixed reality, such as 3-dimensional periodic table and holographic physics visualizer. There is a free software for iPhone by which we can visualize 3-dimensional graphs of functions in the real world. Both sides of inequalities are mathematical expressions of two variables. So the software can visualize inequalities. It’s not just augmented reality but mixed reality. Students can look at the image, move closer, and look into it from various angles. The author also made paper crafts for inequalities. Children like paper crafts all over the world. It is fun to cut craft papers and make them into 3-dimensional figures. He introduced paper craft into his math lessons of inequalities. By the mixed reality software, students can see imaginary figures besides paper craft they are making. They can fix or arrange their paper craft by comparing two figures. Paper craft and mixed reality helped students to understand math inequalities very much.</td>
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<th>J021-A</th>
<th>10:00-10:15</th>
<th>THE USE OF MOBILE AUGMENTED REALITY (MAR) IN DEVELOPING VOCABULARY KNOWLEDGE AMONG LINUS LEARNERS IN MALAYSIA</th>
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<td>lyana Jalaluddin, Ramiza Darmi and Lilliati Ismail</td>
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<td>Universiti Putra Malaysia, Malaysia</td>
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<td>Abstract—In Malaysia, learners who are incompetent in mastering literacy and numeracy concepts remain as a national issue in primary education level (Sani, N. &amp; Idris, A.R., 2013a; Sani, N., &amp; Idris, A.R., 2013). Currently, these learners are categorized as low achievers (LA) or more specifically categorized as LINUS learners. This study focused on Mobile Augmented Reality (MAR) technology developed using the Android platform to enhance vocabulary learning among learners in LINUS program, Malaysia. It specifically focused on LINUS primary year 2 learners who struggle in learning literacy and numeracy. In this study, MAR materials were developed to enrich and enliven the LINUS textbook prepared by Ministry of Education Malaysia. The augmented reality application would display models after detecting fiducial markers</td>
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</table>
created for the LINUS textbook and the multimedia application would present digital material and user-friendly information for the LINUS learners. In order to ensure the learning process was successful, the instructional design model, which is ADDIE, was used in the development of the MAR applications for the LINUS language learning. Overall, this study has a two-fold purpose: 1) develop MAR module and learning materials, 2) to measure statistically the effectiveness of MAR in vocabulary learning. Participants are 160 learners from four different primary schools in Selangor and Kuala Lumpur primary schools. Finding found that after 5 months of implementation, learners were able to use the words orally (i.e. telling a short story) but not in writing (i.e. writing short sentences). This indicates the possibility of MAR use in helping the learners to understand the word meaning and use them in real life. It is hoped that with the creation and implementation of AR materials will be able to enrich LINUS textbook to be more interactive and able to facilitate the learning process of LINUS learners in understanding vocabulary and eventually able to use the words in their learning.

Combining the Fuzzy AHP and TOPSIS to Evaluate Service Quality of E-commerce Website

Wismar Rizki Wijayanti, Wini R. Dewi, Fahmi Ardi, Azrinol Fajri, Muhammad Mujiya Ulkhaq and Pradita Y. Akshinta

Diponegoro University, Indonesia

Abstract—With the aid of the Internet and its rapid global growth, companies struggled to enhance their competitive advantages through the use of electronic commerce (e-commerce) to interact with their customers. Currently, the e-commerce becomes one of the primary modes of purchasing products. In fact, customers are spoiled by the abundant services available on an e-commerce website. As times goes by and as competition increases, the service providers have been competing to provide the best service quality to pursue customer satisfaction. This research tried to evaluate as well as to compare the service quality of e-commerce website using seven criteria of E-S-QUAL and E-RecS-QUAL, namely, efficiency, fulfillment, system availability, privacy, responsiveness, compensation, and contacts. The combination of the fuzzy analytic hierarchy process (FAHP) and technique for others reference by similarity to ideal solution (TOPSIS) are used here to accomplish the objective of the research. The FAHP is employed to determine the weights of each criterion, while TOPSIS is used to identify the ranking of all alternatives to be considered. Two largest customer-to-customer e-commerce websites in Indonesia are selected to be evaluated as well as to exhibit the applicability of the methods.
A Padlet as an Educational Tool: Pedagogical Considerations and Lessons Learnt

Ann Rosnida Md Deni and Zainor Zainal

Sunway University, Malaysia

Abstract—Reported in this study is an academic’s exploration with Padlet to support the teaching of Communication Skills to second year Degree students. Padlet is a web 2.0 tool which can be used to share information, images, audio or video files on virtual walls. The study reports the impact of pedagogical approaches when Padlet was used to support learning. Data collection for this study incorporated qualitative questionnaires, analyses of students’ responses to Padlet activities and teacher’s feedback, and observation of students’ behaviour when Padlet is used in class. The study found that the pedagogical approaches employed had some influence on students’ use of Padlet and despite good intentions, some of these approaches had created barriers to learning. Alternative pedagogical approaches are recommended when using Padlet in the classrooms.

Study on TCSOL Pre-Service Teachers’ Technological Pedagogical Content Knowledge in China Mainland

Shucheng Zhu and Lan Yu

Beijing Language & Culture University, China

Abstract—The definition and framework of technological pedagogical content knowledge (TPACK) have developed along the information technology which integrated in learning and teaching. This paper focuses on how the pre-service teachers in Teaching Chinese of Speakers of Other Languages (TCSOL) perceive and practice TPACK. The questionnaire was designed by Chai et al.(2013c) and translated into Chinese while adjusted to adapt to China mainland pre-service teachers of TCSOL by the authors. There are three aims as follows: the first is to measure the reliability and validity of the questionnaire; the second is to find out the most significant knowledge dimension; the third is to discover the relationship between TPACK of TCSOL pre-service teachers in China mainland and their actual use of information technology. Quantitative research method is used to verify the validity and applicability of the questionnaire based on the TPACK seven-factor model, which is supplemented by group focus interviews. This study finds that most TCSOL pre-service teachers in China mainland think they are most confident in TK, least confident in PCK. The most significant knowledge dimension which impacts on TPACK knowledge is TPK, but TK and TPK knowledge may have the most significant impact on the actual use of information technology.
October 28 <Afternoon>

Session X

Software Engineering and Information Technology

13:30-15:15
Room 1

Chaired by: Prof. Minoru Nakayama
Tokyo Institute of Technology, Japan

Presentations: J054; J117; J131; J2013; J086; J095; J098

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<tr>
<th>Time</th>
<th>Session Name</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliation</th>
<th>Abstract</th>
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<tr>
<td>J054</td>
<td>13:30-13:45</td>
<td>Evaluation of Algorithms to Support Novice Programmer</td>
<td>Ali Houssein Souleiman and Yvan Peter</td>
<td>University of Lille, France</td>
<td>Abstract—An important and crucial factor in the aspects of learning and teaching activities is motivation. In an online learning environment, students are sometimes faced with complex tasks that can reduce learning motivation. In computer learning environment, pedagogical agents were created to promote students’ motivation and learning outcomes. In this article the application of motivation theory in the construction of pedagogical agent motivation is explored. First, the theory of motivation is explained so that it may provide a clear picture of contemporary motivation theories that sometimes may appear similar. Second, motivation theories applied in online pedagogical agents are analyzed and reviewed. At the end of the article, several directions of design research for pedagogical agent motivation for the future are illustrated.</td>
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<tr>
<td>J117</td>
<td>13:45-14:00</td>
<td>An anonymous authentication mechanism based on Kerberos and HIBC</td>
<td>Fan Linna, Song Xiaofeng, Zhao Weiwei, Ran Haodan, Li Jingzhi, Shi Deyang, Mu Suining and Qi Tao</td>
<td>National University of Defense Technology, China</td>
<td>Abstract—With the development of the grid and more and more attention attached to the privacy security, there is an urgent need of a secure anonymous authentication mechanism. In order to meet this requirement, we proposed an anonymous authentication mechanism based on Kerberos and HIBC, which is called KHIBC. It can meet the demand of authentication of Grid. At the same time, it can also protect the users’ identity through anonymous method. Through analysis, KHIBC can meet the requirement of anonymity, mutual authentication, traceability and so on.</td>
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<tr>
<td>J131</td>
<td>14:00-14:15</td>
<td>Functional Requirement on Proofreading System</td>
<td>Lupita Sari and Choirun Niswatin</td>
<td>Politeknik Kota Malang, Indonesia</td>
<td>Abstract—This research aims to have an analysis on functional requirements to build the proofreading system. It is used to justify the appropriateness of functional requirements which gained from interview to the project owners and end users’ questionnaires. Kano method is applied to compare both of data from interview and questionnaires. It classifies the provides features into some categories to measure the users’ satisfaction level. The result of Kano evaluation shows that only one out of 17 features is not important in the perspective of users. In contrast, other features are important for them, however, each of features should be determined into its priority</td>
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to develop the system using Kano. The system development must be started from features which are prioritized the criteria be (M) followed by one-dimensional (O) then attractive (A). There are 6 features which are differently perceived between lectures’ and students’ point of view. This differentiation makes project owners difficult to prioritize the features development since the weaknesses of Kano which could not disclose the users’ reasons.

AMPM3 criteria of algorithm summation for classifying data mining of software quality management
Kattiya T. Yangyuen, Tipaporn Suppamit and Surasak Mungsing
Rattana Bundit University, Thailand

Abstract—This research has the objective to present the algorithm summation method of AMPM3 criteria for reducing attributes in data mining classification of software quality management. Moreover, the programs used to analyze in this research are WE-KA and MATLAB and the techniques used to predict the equation and the accuracy are Decision Tree, Rule-Based, Naïve Bayesian and KNN. Besides, the results of analyzing the Algorithm with AMPM3 criteria are to reduce the attributes from searching from the relationship of regression analyzing and the regression analysis that are the analyzing from the relationships between 2 variables for finding the similarities between questions and model documents by searching from the patterns of designing. Then, it has the steps as these following: 1) Preparation of Information 2) Selection of Information 3) Practicing Information Set and Test 4) Processing of Information 5) Creation of Model for analyzing the information relationship and effectiveness measurement to reduce attributions.

Book Recommended Formulation Based on Multiple Bibliographic Information
Suthathip Maneewongvatana, Apilak Suntornacane and Nattapol Assawawayuyothin
King Mongkut’s University of Technology Thonburi, Thailand

Abstract—We proposed the formulation for discovering the candidate bibliographic records for the primary resource by integrating multiple bibliographic parameters including call number, subject heading, and title’s keyword. To imitate the searching procedure of librarians, we can customize weights for assigning different priority for different bibliographic parameters. The precision and recall of the retrieval lists were compared to the performance of librarians. The results show that the quality of the recommended list formulated by our proposed system is comparable to the list from librarian. However, the performance of the proposed system can be improved by integrating NLP algorithm, and more bibliographic information.
### ABSTRACT

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<tr>
<td>J095 14:45-15:00</td>
<td>Design and Practice of Virtual Simulation Experiment for Broadband Wireless Communication</td>
<td>Meijuan Chen, Xiaorong Zhu, Jianhua Shen and Fei Li</td>
<td>Nanjing University of Posts and Telecommunications, China</td>
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</table>

Abstract—The new generation virtual simulation experiment platform for broadband wireless communication provides the topology planning, capacity planning, device configuration, data configuration and service verification functions for Long Term Evolution (LTE) network, the Packet Transport Network (PTN) and Optical Transport Network (OTN). Firstly, based on the platform, the OTN experiment, the PTN experiment, the LTE experiment and the interconnection experiment are designed, the experimental type includes verifying and designing. The network optimization experiment and the comprehensive experiment are also designed. Secondly, the implementation methods of these experiments for different courses are proposed. Finally, the teaching effects of the experiments are demonstrated through questionnaires, the results illustrate the effectiveness of the experiments.

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<td>J098 15:00-15:15</td>
<td>Simulation Design and Performance Evaluation of LWIP System</td>
<td>Xiaorong Zhu, Kexun Chen, Xiaoyi Zhang and Meijian Chen</td>
<td>Nanjing University of Posts and Telecommunications, China</td>
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Abstract—Tightly coupled LTE—Wi-Fi networks have emerged as a promising solution for improving capacity and coverage of wireless networks. Different architectures which realize this integration include LTE—Wi-Fi radio level interworking with IPSec tunnel (LWIP) and LTE—Wi-Fi Aggregation (LWA). In this paper, we firstly have described the structure of LWIP and stated its specific implement process. Then we have designed and implemented three different scenes to compare the performance differences between LWIP and LTE/WLAN. Simulation results demonstrate that the performances of LWIP are better than separate LTE and WLAN.

### Coffee Break
15:15-15:30
ABSTRACT

October 28 <Afternoon>

Session XI

Software Engineering and Information Technology

15:30-17:00
Room 1

Chaired by: Prof. Joy Kutaka-Kennedy
Sanford College of Education, National University, USA

Presentations: J136; J069; J027; J128-A; J031; J067

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<th>J136</th>
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<tr>
<td>Privacy and availability in cloud data warehouse</td>
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<tr>
<td><strong>Karkouda Kawthar</strong>, Nabli Ahlem and Gargouri Faiez</td>
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<td>University of Sfax, Tunisia</td>
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<td>Abstract—With the rise of cloud computing, data warehouse can benefit from this new technology in term of cost reduction, computing power and response time. However, as each technological advance, the cloud computing also brings its own risks, particularly in terms of security that must be taken into account to enjoy all the benefits of this solution. For that, in this paper, we propose a new secure scheme for outsourced data warehouse in the cloud. This new scheme is based on the (n, k) Shamir secret sharing schemas, information dispersal algorithm IDA and multivalued order preserving encryption MV-OPE. The proposed scheme guarantees data availability, confidentiality and enables analyzing data in the cloud without post processing in the client.</td>
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<th>J069</th>
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<td>Influence of the use of educational Apps on smart mobile devices in the academic performance of students</td>
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<td><strong>Benjamín Maraza Quispe</strong>, Luis Alberto Alfaro Casas, Olga Melina Alejandro Oviedo, José Alfredo Herrera Quispe, Crisia Vivanco Chavez, Rolando Vilca Pucho, Benedick Dominguez Joaquin and Nicolas Caytuiro Silva</td>
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<td>San Agustín National University of Arequipa, Peru</td>
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<td>Abstract—This research work aims to evaluate the academic impacts that educational applications use in smart mobile devices with Android operating system in students of the professional career of Computer Science. To do this, an analytical, quantitative and descriptive investigation was carried out, where the variables were: The use of educational applications for the learning process in a group of students as an independent variable and academic performance as a dependent variable. The following research problem was formulated as a question: To what extent does the use of Android Educational Applications have generated a positive impact on the academic performance of students in the professional career of Computer Science? To substantiate the question, investigate the applications from the beginning, the characteristics, the benefits, and also the damage it can cause, in addition to its application in education and its importance. A sample of 163 students was chosen, who were subjected to a multiple review survey of the academic influence of the use of educational applications. The results obtained proved that the use of educational applications has a positive influence on the academic performance of students, however, it is necessary for students to use these technologies for non-commercial purposes.</td>
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ABSTRACT

**J027**

16:00-16:15

**Fuzzy AHP and TOPSIS in Cross Domain Collaboration Recommendation with Fuzzy Visualization Representation**

Maslina Zolkepli and Teh Noranis Mohd Aris

Universiti Putra Malaysia, Malaysia

Abstract—Cross domain collaboration recommendation method is proposed by combining fuzzy Analytic Hierarchy Process (AHP), fuzzy Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and fuzzy network graph for interactive visualization method. Existing cross-domain recommendation tackles the problem of sparsity, scalability, cold-start and serendipity issues found in single-domain, therefore the combination of fuzzy AHP and TOPSIS with visualization method may be able to give decision makers a quick start to initiate cross-domain collaborations. The proposed method is applied to the DBLP bibliographic citation dataset that consists of 10 domains in the field of computer science. Results show that the combination of fuzzy AHP and TOPSIS enables decision makers to find several authors from across domains that consist of 2.2 million publications in less than 3 minutes. The combination method will be represented in fuzzy visualization technique for fuzzy data. The establishment of the cross domain recommendation will set a stage for efficient preparation for researchers who are interested to venture into other domains to increase their research competency.

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**J128-A**

16:15-16:30

**Situational Interest and Students' Perception of Learning Content in an Online SW Program**

Hyejin Park, Yoojung Chae and Sunghye Lee

KAIST Global Institute for Talented Education, South Korea

Abstract—The aim of the present study was to investigate whether both situational interest and perception of learning content were related to academic achievement, and how students' perception of learning content was related to situational interest in an online SW program such as Algorithm and Scratch. Participants were 118 students (5th graders - 9th graders) enrolled in a SW online program offered by K University. The students responded to a survey measuring their situational interest and the perception of SW learning content (challenge, choice, meaningfulness, and self-efficacy). In the SW learning program, eight SW contents were provided for students during the 12-week semester. At the end of learning, the learners conducted situational interest and perception of learning content survey by an online and 8 surveys were conducted overall. In order to answer the research question, correlation and regression analyses were performed. The result indicated that situational interest in the first half of eight contents was related to academic achievement, while the other
half turned out to be unrelated. Among the perceptions of learning content, self-efficacy was only a significant predictor of academic achievement and was correlated with it. It was founded that student’s perception for learning content was significantly correlated with situational interest. Especially, the choice among the perceptions of the learning content was generally a significant predictor of situational interest. It was turned out that challenge, meaningfulness, and self-efficacy in the part of eight SW contents also were predictors of situational interest. Moreover, the situational interest of the previous content appeared to be a significant predictor of situational interest in the next content. Results suggest that situational interest is an important factor for student’ learning as well as the factors affecting their learning motivation such as challenge, choice, meaningfulness, and self-efficacy. The implication of this study will be suggested in this presentation.

Expert Opinion Taking Process: Applications in Education

Bayona-Ore Luz, Fernandez Zavala, Ronald and Luyo Cruz, María
UNIVERSIDAD AUTONOMA DEL PERÚ, Peru

Abstract—Expert opinion is a technique used in different areas of scientific research, which, in some way, guarantees its social and methodological validity. This method is also used as an instrument to make long-term predictions, with different types of solutions to obtain a concise answer that is achieved with the help of experts who exchange information, cultures and experiences to provide solutions to the relevant and timely problems that may arise. The purpose of this article is to review the quality literature regarding experts' opinion of different applications. This research resulted in an extensive relationship with the topics of technology, technology foresight, and especially education.

Exploring the Provenance and accuracy as metadata quality metrics in assessment resources of OCW repositories

Audrey Romero-Pelaez and Veronica Segarra Faggioni
Universidad Tecnica Particular de Loja, Ecuador

Abstract—Open Education is a movement that was born with the purpose of bringing knowledge to disadvantaged sectors and opening the doors to better education opportunities for all. Open Educational Resources (OER) such as Open CourseWare (OCW) has become support resources in the educational environment. For this reason, the quality of the repositories is highlighted by the quality of their metadata. The metadata is one characteristic of the repositories, that facilitates the search and discovery tasks of educational resources, in this way ensures their reuse. Consequently, to assure universal access to quality knowledge there are some metrics
ABSTRACT

of metadata quality to evaluate OCW repository metadata: completeness, consistency, coherence, accuracy, provenance, and accessibility. In this study, accuracy and provenance are prioritized as quality metrics for metadata quality evaluation because they support potential users in the search and selection of OCW resources. This paper uses a set of data from the repository of semantic search engine Serendipity in order to evaluate the selected quality metadata metrics, applying cosine distance technique and calculation of completeness of provenance metadata because it is an important aspect of validating quality criteria for ICT tools. When the corresponding values of the study metrics are obtained, the analysis of the obtained results is performed. Two important findings are identified. First, the cosine technique is an important tool to find the semantic distance between the resource and its metadata. Second, the PAV ontology provides provenance properties of an OCW that helps in obtaining the provenance quality of a resource. This paper is limited to the dataset available in Serendipity semantic search engine, however, it is considered that the interpretation of the findings does not vary if we use a specific repository. The lessons gleaned from this study suggest that the metrics evaluated, which are not the only ones, are relevant to the metadata quality of repository. This study represents a metadata quality assessment approach based on two key metrics that are considered as relevant to be used as criteria of search and selection of a resource by the OCW’s user.
Session XII

Engineering Education and Learning

13:30-15:15
Room 4

Chaired by: Assoc. Prof. Chor-Kheng Lim
YuanZe University, Taiwan

Presentations: J105; J058; J133; J015-A; J029; J047; J039

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<th>J105</th>
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<td><strong>ABSTRACT</strong></td>
<td>Research on BIM teaching reform of Water and Wastewater Science &amp; Engineering Specialty</td>
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<td>Jincheng Li, <strong>Wenxiang Xia</strong>, Baoxiu Zhao, Jie Liu, Tianyu Li and Zhiqiang Liu</td>
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<td>Qingdao University of Technology, Qingdao, China</td>
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<td>Abstract—BIM (Building Information Modeling) is a hot spot of research and practice in construction industry. It does not only contain 3D/4D/5D models, but also the entire management process to increase the performance level of construction life circle. BIM is the trend of design, construction and management in construction and municipal engineering. It is also an important aspect for future students of wastewater science &amp; engineering (WWSE) specialty to learn. However, the lack of BIM talents has become the biggest limiting factor for the application of the technology. In this paper, three possible ways of BIM teaching reform of water and wastewater science &amp; engineering specialty are discussed: setting up independent BIM courses; embedding BIM related content into existing courses; and combining BIM courses with entrepreneurial research projects for undergraduates. In conclusion, students' professional quality, practical ability, communication and collaboration ability can be enhanced through BIM classroom teaching, experimental teaching and BIM industry expert lectures, and the comprehensive quality of water and wastewater science &amp; engineering specialty graduates can be improved.</td>
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<td><strong>ABSTRACT</strong></td>
<td>IT Student Project Based Learning Based on User-Oriented Approach- A Practical Oversea Collaboration Workshop</td>
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<td>Chikako Morimoto and Shin-ya Nishizaki</td>
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<td>Tokyo University of Technology, Japan</td>
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<td>Abstract—Recently, many companies in the Information Technology (IT) industry are shifting focus from software development to providing software services. So, the design thinking that proposes to start from the user's point of view is accepted by many industries. We executed the collaboration workshop that the IT students learn practical lean start-up by short-term PBL (Project Based Learning) with overseas engineers. There are two aims of the workshop. The one is an exercise of business idea creation and verification it using lean canvas. The other is the learning of team building and communication. The communication includes the team building. It is a just 5 days’ workshop, but the students got the progress in communication skills and also engineers improved their communication skills, business creation skills and changed their business viewpoint. In this paper, we report on its detail and efforts.</td>
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ABSTRACT

Application AR in Field experience education: Development of teaching aids in Chinese literature and Taoyuan local culture

Chor-Kheng Lim, Ming-Chih Huang, Fang-Yu Chen
YuanZe University, Taiwan

Abstract—This study aims to develop an AR teaching aids in enhancing the pleasure of reading poetry, listening to poetry, and even playing poetry. The AR teaching tool developed is an interactive teaching medium that combines both landscape culture and literary poetry. This tool can solve the problem of concentration of students when in the field experience, and make the literature education more interesting and lively, and even more in-depth understanding of the imagery in the poetry. This study spatializes the imagery in poetry and characters in three dimensions, and then overlaps with the real field in using AR technology. It hopes to reproduce the situation that the poet experienced during the current creation, which helps the reader to understand the connotation of the text and understand. The beauty of artistic conception in poetry. In addition, the AR system allows students to create in the field, by dragging modular 3D space components, reorganizing the new mood of the mind, while also practicing writing poetry, to achieve the field experience, as if they are poets like live poetry.

Wikipedia- Advanced & reliable educational tool

Mohammed Galib Hasan
Wikipedia Education Program, Bangladesh

Abstract—In the 15+ years of its existence, Wikipedia has grown to be one of the most important sources for knowledge worldwide. The brand name Wikipedia stands for a number of different projects in almost 300 languages which give anybody with access to the internet and the ability to read a wide range of information – from in-depth medical knowledge to the latest updates on popular TV-Series, from exact geographic location of mountains and rivers, to extensive descriptions on historical artworks. All this knowledge is presented in a neutral way and most articles have reliable and trustworthy sources. Wikipedia can be accessed around the globe, even in places where it is difficult to have access to books and no libraries exist. Through this, it can be extremely useful to Educators and students, who otherwise would have difficulties doing even simple research projects. However, one problem exists – not all language versions do have the same content. English Wikipedia has the highest number of articles, and so the most knowledge. People who do not speak English have access to less knowledge than English speakers. People from all over the world contribute to the English Wikipedia because of that. But again, only those that speak good English can
### ABSTRACT

**J029 14:30-14:45**

**A teaching research for packaging design in brand building - A case study of tea packaging in TeamaHuang**

Yu-Che, Hsiao Ming-Yu, Yi Hong-Jin and Yeh Tien-Chaun
Chaoyang University of Technology, Taiwan

Abstract—The brand is now an important tool for identifying products. Through physical packaging, it can directly generate links with consumers and convey the brand’s ideas to consumers. And packaging design is increasingly important in today’s business activities. Teaching is more important for brand design. How to provide teaching and reference examples that can help with actual design is the core values of this study. This study summarizes the key points of building brand and packaging design through case studies, and organizes them into a design process based on scholars’ suggestions for packaging design. The tea packaging design process is illustrated using the Teama brand packaging design as an example. First of all, analyze the requirements of the theme and market background, and determine the positioning of the brand. Then design the brand image, and from the target group feedback and response, make changes to the brand positioning, and finally is to plan future strategy of the brand. This article describes the packaging design process of Teama brand building in detail and complete, and combines the teaching points on the packaging design that scholar once proposed. We hope that through the process of actual operation in this study, for the latecomers in the use of packaging design for brand building, there can be a set of reference methods and basis.

### J047 14:45-15:00

**A study for commercial design in the application of innovative design courses**

Huang Yu-Che and Liu Cheng-Yu
Chaoyang University of Technology, Taiwan

Abstract—The development and teaching of innovative design courses has always been a topic that many schools are currently concerned about. Many of the innovative teachings are mostly inspired concepts of innovation. After actual commercialization, specific outputs are obtained. How to find a good topic through patents The analysis, and then use the actual model of production, do product verification, complete creativity and innovation. In this study, creative creativity was adopted as the core of curriculum creative innovation in commercial design of industrial design. Through a process of market research, patent analysis, concept design and sample production, a design case was used as an example of a creative innovation course. A reference material for future innovation to commercialization
Latent Class Analysis of Student Artefacts

Po Kwok Chan and Chan Hung Shek
City University of Hong Kong, Hong Kong

Abstract—City University of Hong Kong has implemented Discovery-enriched Curriculum (DEC) since 2012. Teaching staff has submitted student artefacts as the supplementary evidences for DEC implementation. In this report, the data in form of student artefacts were analyzed using latent class analysis (LCA) performed in R software to show whether there is any relationship between the type of student artefacts, academic background and sources of evidences. Results showed that these student artefacts could be categorized into 4 latent classes based on their type of expression and authenticity. Students from different academic background showed different probability to 4 latent classes. Furthermore, students tended to create evidences and achieve authentic tasks, related to artistic or entrepreneurial activities, from their personal work rather than course work. Results demonstrated that under CityU DEC framework, students were able to create knowledge and make discovery in form of the outcomes classified as the 4 latent classes.

Coffee Break
15:15-15:30
Session XIII

Business Intelligence and Product Design

15:30-17:00
Room 4

Chaired by: Assist. Prof. Suwichai Phunsa
Mahasarakham University, Thailand

Presentations: J017; J013; J035-A; J057; J130; J113

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
ABSTRACT

A Study for Six Types of Chinese Character in the Cultural Product “Mid-Autumn Festival as an Example”

Huang Yu-Che, Ho Li-Ying, and Hsiao Ming-Yu
Chaoyang University of Technology, Taiwan

Abstract—21st century is an era in which the internet and transportation are intensively linked. Through this tendency, local culture can develop toward globalization. Globalization is the focus of contemporary culture, and cultural practice is the core of globalization [1]. Based on the globalization tendency and social and cultural theories, cultural products have been one of the main product development. To carry out the designing form of cultural products, we must first discuss the cultural definitions and the cultural characteristics. This study utilize festival as the structure, based on the semiotics of message communication and introduce the six types of Chinese character development background and its classification principles then select the feature of Mid-Autumn Festival to create a series of product design methods, in order to trace back each culture meaning in the Instructional design. Finally, the established design methods were used to verify the six types of Chinese character proposed in this study, which are the feasibility Pictograms, Self-explanatory, Determinative-phonetics, Associative compounds, Mutually interpretative symbols and Phonetic loans. It is expected to provide some contribution to future design related practitioners some instructional design and design process applications.

A Study for Differences between Different Order Thinking Skills Applied by Industrial Designers when Using 3D CAD

Huang Yu-Che, Chen Jan-Nan, Yeh Tien-Chaun, and Tsai Chen-Yu
Chaoyang University of Technology, Taiwan

Abstract—Most designers today use computer aided design software (CAD) to assist and implement their ideas. Through the construction of 3D models, can help designers more specifically express their ideas. However, the process of modeling itself is a design process, but designers use different ways of thinking, which will make the process of construct the model different, and allow designers to complete the design of different efficiency. In this study, the lower-order thinking design process and the higher-order thinking design process will be given to the subjects in two different ways: Bottom-Up and Top-Down. Then, this study simulates the problems that may be encountered when constructing the 3D model, and then allows the subjects to construct 3D models with different degrees. Through experimental design, explore the differences and impacts between them. And provide a reference for constructing models and learning new software for industrial designers. Finally, we found that after
### ABSTRACT

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<tr>
<th>J035-A</th>
<th>16:00-16:15</th>
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<tr>
<td><strong>PARAMETERS THAT INFLUENCE THE JUDGEMENT OF FEMALE BODY SHAPE</strong></td>
<td><strong>ATTRACTIVENESS ON A FABRIC PRINTS</strong></td>
</tr>
<tr>
<td><strong>Man N.M. Cheung</strong></td>
<td>The Hong Kong Polytechnic University, Hong Kong</td>
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<tr>
<td><strong>Abstract</strong>—With the fast growing development of the computer technology, applications of software provide a capable platform for the apparel industry in simulating digital textile prints and virtual 3D body models. In view of this, the objective of this research is to develop an interactive digital prints on 3D body models for apparel industry through the study of critical parameters that influence physical attractiveness of female body. The developed digital prints on 3D models are able to support designers in creating attractive garment prototypes more easily and accurately during the process of sample development; while the system can also be adopted as a useful tool and comprehensive platform for educational purpose.</td>
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<th>J057</th>
<th>16:15-16:30</th>
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<tr>
<td><strong>A Study on the Acceptance of Internet Banking</strong></td>
<td><strong>Solomon Oluyinka, Anatilia N. Endozo and Roland Calma</strong></td>
</tr>
<tr>
<td><strong>Baliuag University, Philippines</strong></td>
<td><strong>Abstract</strong>—Internet banking expected to ease commercial transactions and uplift satisfactory services. Studies affirmed internet banking in Nigeria is low compared with other e-banking systems. This study analyzed mediation role of trust in technology, theory of planned behavior and trust model adoption. Statistical package for the social science (SPSS) and VBSEM-AMOS adopted for descriptive statistics and modeling principal mediation effect of trust based on 391 respondents. Finding indicated that TPB factors; subjective norm, perceived behavioral control, attitude and trust regressed on intent to accept internet banking and achieved a 72% variance explained, integrity, benevolence, competency and predictability regressed on trust to internet banking acceptance and a 71% variance explained. However, partial mediation trust effect achieved a 73% variance explained of TPB with exclusion of attitude in the model. This study justified the mediation role of trust in internet banking acceptance in Nigeria thus, recommended further replication in different dimensions.</td>
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### ABSTRACT

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<th>Session</th>
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<th>Speaker</th>
<th>Institution</th>
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<tr>
<td>J130 16:30-16:45</td>
<td>Developing an Interactive Augmented Reality to Promote the Products of Local Entrepreneur</td>
<td>Suwichai Phunsu</td>
<td>Mahasarakham University, Thailand</td>
</tr>
<tr>
<td>J113 16:45-17:00</td>
<td>Holonomic Function of 2 Parameter Logistic Model Item Response Theory Parameter Estimation</td>
<td>Kazuhisa Noguchi and Eisuke Ito</td>
<td>Kyushu University, Japan</td>
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**Abstract**—The implementation of Augmented Reality (AR) seems to be expanding gradually so that more retail business owners used this AR technology for marketing their online shopping as a tool to help the customers simply make their buying decision in the future and this research paper introduced an Interactive Augmented Reality model to promote the products of local entrepreneurs by creating their business cards for the customers to update the information and shop the products via their smartphones. Practically, the customer could immediately interact with their devices through the user engagement function. After that, there would be an evaluation on the local entrepreneurs' satisfaction to see if it was possible to connect them to new product design. Finally, all comments and problems were collected for further development.

**Abstract**—IRT (Item Response Theory) is a theory for scoring of tests, and it used for some test systems such as TOEFL. IRT's estimation is item parameter for each question, and examinee's ability parameter. We propose a new method to estimate parameter of IRT using the Holonomic Gradient Method. When we use Holonomic Gradient Method, we check target function is Holonomic Function. Our target function is 2 Parameter Logistic Model IRT's Likelihood Function. In this paper, we show target IRT's Likelihood Function is Holonomic Function.
Session XIV

Learning Method and Purpose

14:30-17:00
Room 3

Chaired by: Prof. Piet Kommers
University of Twente, The Netherlands

Presentations: J046-A; J056; J090; J125; J1005; J079-A; J104; J052; J123

※Please arrive at the designated conference room 15 minutes earlier, in case some authors are not able to make the presentation on time.
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<tr>
<td>J046-A</td>
<td>Development of Quiz-Based Role Playing Game for Algorithm Learning</td>
<td>Kousuke Watanabe and Yutaro Ohashi</td>
<td>Abstract—Currently, computers and smartphones are indispensable information equipment for our everyday life, but the shortage of the human resources in information technology industry is a risk for its development. One of the reasons is that it is hard to learn about programming language for beginners. Especially, many beginners suffer from complicated processes such as recursion and pointer which are inherent in many programming languages. Algorithmic knowledge helps to understand the complicated processes for beginners. However, most of teaching materials of the programming language focus on how to write program especially syntax. Therefore beginners are confronted to deepen understanding about algorithm. In this research, we developed a quiz-based role playing game for algorithm learning. We aimed at maintaining learners’ motivation and continuity to learn algorithm by using a game-based learning material. The result showed that the game we designed helped learners’ to understand the concept of algorithm.</td>
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<td>J056</td>
<td>Investigation of Motivational Theory on Pedagogical Agent Design in the Online Learning Environment</td>
<td>Ati Suci Dian Martha and Harry B. Santoso</td>
<td>Abstract—An important and crucial factor in the aspects of learning and teaching activities is motivation. In an online learning environment, students are sometimes faced with complex tasks that can reduce learning motivation. In computer learning environment, pedagogical agents were created to promote students’ motivation and learning outcomes. In this article the application of motivation theory in the construction of pedagogical agent motivation is explored. First, the theory of motivation is explained so that it may provide a clear picture of contemporary motivation theories that sometimes may appear similar. Second, motivation theories applied in online pedagogical agents are analyzed and reviewed. At the end of the article, several directions of design research for pedagogical agent motivation for the future are illustrated.</td>
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<tr>
<td>J090</td>
<td>Learning strategies in Colombian university students</td>
<td>Ingrid Fonseca and Milthon Betancourt Jiménez</td>
<td>Abstract—Learning strategies are planned and intentional activities and processes that students perform to achieve educational objectives and facilitate the storage and retrieval of information. Education strategies are used by students to achieve educational objectives as efficiently as possible. The purpose of this study is to describe the educational strategies used by students in Colombian universities. This study was carried out with a sample of 400 students from four Colombian universities, using a survey instrument designed to collect data on the educational strategies used by students. The results of this study showed that the students used a variety of educational strategies, including self-study, collaborative learning, and use of technology. These results have important implications for educators and policymakers, as they can use this information to improve the quality of education and support students in their learning.</td>
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ABSTRACT

In the university context, it is important to have academic environments where students feel supported and motivated, taking into account the characteristics of each one to promote the ability to make decisions, acquire skills to process, and evaluate information. Therefore, the main objective of the article is to identify the learning strategies of Colombian university students. The incidental sample of the research is 164 students aged between 19 and 28 years. The CEVEAPEU questionnaire (Evaluation Questionnaire for the Learning Strategies of University Students) was used as an instrument, which consists of 88 items and 2 scales, strategies affective, support and control and strategies related to the processing of information. The reliability of the instrument was analyzed (very high) and the descriptive statistics were determined. The average of all items is high and the highest values are intrinsic motivation, task value, transfer and use of information and acquisition of information. The lowest correspond to external attributions, extrinsic motivation, anxiety, storage, simple repetition, organization and memorization. It is concluded that students value the importance of 'learning to learn' and have strategies for their training such as time planning, counseling, interaction and cooperation. In aspects to improve, it is necessary to train students to perform previous readings, diagrams, conceptual maps and summaries of the topics studied. Similarly, it is recommended that teachers promote an active and participatory teaching, with a greater role of students and an appropriate motivational climate.

Coffee Break
15:15-15:30

Learning Materials Design for Higher Vocational Engineering Students to Support their ability in Academic Writing

Choirun Niswatin, Dita Lupita Sari and Mohammad Adnan Latief
Politeknik Kota Malang, Indonesia

Abstract—Materials for English language teaching (ELT) are mostly designed for teaching language rather than learning it. This paper outlines the English as a foreign language (EFL) learning materials development for vocational higher students particularly on writing an abstract. Research and Development (R&D) was applied to this research but simplified into four steps; needs analysis, product development, expert validation, and try-out. Overall, the learning materials design is acceptable particularly on its specification to meet the goal of learning. In addition, it is set up into
ABSTRACT

e-learning which provides features of online chat letting the teachers and students have the flexibility of personal tutoring. The system is also equipped with the discussion forum as well to open the potential learning in group to discuss any problem occurring in writing an abstract. Kano method has been applied to developed the e-learning system after having functional requirement to meet the users’ needs. What is more, the learning materials design seems to encourage students to confidently learn writing academic more and they could decide when they are ready to learn it any time. The findings suggest teachers to apply the designed learning materials to the real English language classroom by higher vocational engineering students. Future researchers could conduct an experiment to assess the effectiveness of the learning materials design to promote the students’ achievement in their academic writing.

The Use of Edpuzzle to Support Low-Achiever's Development of Self-Regulated Learning and their Learning of Chemistry

V. S. Giita Silverajah and Anandraj Govindaraj
Jalan University, Malaysia

Abstract—Education professionals have identified that self-regulated learning skills is critical in fostering lifelong learning. Being academically at risk students, low-achievers can benefit academically if they develop self-regulated learning skills. This paper investigates student and teachers’ perception on Edpuzzle activities in supporting development of self-regulated learning skills among low-achievers. The participants of this study were 18 Chemistry students enrolled in the Australian Matriculation (AUSMAT) Programme at Sunway College, Malaysia. The distributed Edpuzzle activities comprise of five units, which contains video and quizzes located in parts of the video. Further, peer and teacher assistance were provided to support low-achievers’ learning. A mixed method data collection technique was employed using a survey questionnaire which consists of closed-ended and open-ended questions, along with teacher reflective notes. Analysis of data revealed that the use of Edpuzzle permits a flexible environment to students which supports the development of self-regulated learning skills. Even though most low-achievers favoured the use of self-directed learning resources to support their learning, some were reluctant and preferred the face-to-face learning approach. On the whole, this study provides valuable insights on teacher preparation for low-achievers in encouraging them to become autonomous learners.
Digital Learning 4.0 Digital Learning that sticks

Paul Hunter
International Institute for Management Development, Switzerland

Abstract—How can you create digital learning that sticks? For online learning to yield tangible results, a number of elements need to be deployed in parallel and constantly adjusted throughout the learner’s journey. In this session we will examine the 7 key success factors which ensure that learners are not only engaged, but also transfer their learning into meaningful actions in their professional and personal contexts.

We will look at 3 component parts—designing online journeys, producing online material and delivering online programs—all of which need to be addressed in a holistic fashion to ensure learning impact.

Attendees at the end of this session will have been made aware of the typical traps many executive education providers fall into as they seek to expand their reach through the use of digital learning offerings.

They will also have had the opportunity to reflect on the pedagogical principles that underpin successful online e-learning and why these are different from the pedagogical principles that underpin face to face learning encounters.

Finally they will leave the session equipped with the key success factors that will guarantee measurable impact from the online programs they design, produce and deliver.

Monitoring Learning Activities using Social Knowledge

Rubén Fuentes-Fernández and Frederic Migeon
University Complutense of Madrid, Spain

Abstract—Learning activities use an increasing number of software tools. These mediate the interactions among participants and of these with resources like documents and tools. These tools constitute a valuable source of information about the actual learning processes. However, this use faces multiple problems. Lecturers need to gain expertise on the data each tool provides and how to analyse them, each tool only offers a partial view of the process, students have different profiles and use different tools, and time to make analyses is limited. To address this situation, this work proposes the use of Assistants for Learning Activities (ALAs), i.e. semi-automated tools that use social knowledge to integrate different sources of information and interpret their data. This knowledge is extracted from literature on learning, and specified as social properties. These properties describe patterns that appear in information and their interpretation in terms of the learning-related activities. Their specification relies on a specific modelling language oriented to social
ABSTRACT

activities and their context. It is designed to facilitate communication with the target learning communities. Wrappers for software tools get the raw data, transform them into facts for this language, and assert them in an information base. Then, a pattern matching algorithm finds instances of the social properties among these facts, giving an interpretation of the original data. A case study on teamwork in a project-based learning context of a university using several software tools illustrates the approach. It shows the feasibility of adapting the analysis through the modification of the considered properties, and how these can explain the observed data.

Implementation of Project-based Learning in Materials Engineering Course: An Experiential Approach

Rakesh Chaudhari, Praveen Kumar Loharkar and Asha Ingle
SVKM’s NMIMS MPSTME Shirpur Campus, India

Abstract—Modern educational paradigm demands transition from the conventional mode of teacher centric to learner-centric teaching-learning process. The article presents the efficacy of Project Based Learning (PBL) methodology in the course of Materials Engineering, which is a part of the second year undergraduate program in mechanical engineering. A case study on the implementation of PBL is demonstrated with quantified outcomes. The success percentage of different PBL activities has also been determined. It has been observed that PBL has made a positive impact on the students’ overall approach towards the learning of the course. PBL has also resulted in attainment of learning objectives linked with higher level cognitive skills. The study has also helped in identifying stronger as well as weaker aspects of student learning. Moreover, implementation of PBL has demonstrated the need for change in existing course design to incorporate PBL.

A tablet-type acoustic digital pen that presents pen strokes with music tones

Kazuki Nakada, Makoto Kobayashi, Yasuyuki Murai and Iwao Sekita and Hisayuki Tatsumi

Tsukuba University of Technology, Japan

Abstract—This study presents a tablet-type acoustic digital pen that presents pen strokes in handwriting with music tones. An acoustic digital pen for the visually impaired has been previously proposed, and it is shown that the pen-tip position (sound localization) can be identified by continuously changing the volume and acoustic frequency in correspondence with the pen strokes in space. In the tablet-type acoustic digital pen proposed in this study, we change the musical scale in the horizontal direction and the octave in the vertical direction on a spatially discretized 2d grid. By enabling the grid to be adjusted to the desired size using the pinch in/out
ABSTRACT

operation on the tablet touch screen, it is possible to efficiently practice writing letters of various scales in a balanced manner. Furthermore, by changing the music tone (frequency distortion) in accordance with the pen touch at character feature points, such as the start point, via the end point of each pen stroke, the proposed design eases learning of the tome, hane, and harai accents.
| Listener 1 | Johan Fång  
Municipal of Ödeshög, Sweden |
| Listener 2 | Hans Wågbrant  
Municipal of Ödeshög, Sweden |
| Listener 3 | Jan Moren  
OIST, Japan |
| Listener 4 | Jong Hee Park  
Kyungpook National University, South Korea |
| Listener 5 | Ikhsan Sutaj  
National Cyber and Crypto Agency, Republic of Indonesia |
| Listener 6 | Fahmi Rismawan, Subarkah  
National Cyber and Crypto Agency, Republic of Indonesia |
| Listener 7 | Zainor Izat Zainal  
Universiti Putra Malaysia, Malaysia |
| Listener 8 | Carla Atzeni  
Sardegna Ricerche, Sardinian Regional Agency, Italy |
| Listener 9 | MENG-YING LIN  
National Changhua University of Education, Taiwan |
| Listener 10 | Caytuiro Silva Nicolas Esleyder  
High Performance School of Arequipa, Peru |
| Listener 11 | Thomas Mogale  
University of South Africa, South Africa |
| Listener 12 | Truida Oosthizen  
University of South Africa, South Africa |
| Listener 13 | Nyamsuren Boldbaatar  
Institute of teachers' professional development, Mongolia |
| Listener 14 | Baasantogtokh Batsaikhan  
Institute of teachers' professional development, Mongolia |
Located virtually on top of JR Hamamatsucho station, and close-by to many of Tokyo’s most famous attractions, the WTC is easily accessible to those tourists exploring Tokyo city. The large glass windows provide unobstructed views of Mt. Fuji, Tokyo Tower, Tokyo SkyTree, Roppongi Hills, Tokyo Bay and almost everything in between, with rental binoculars allowing you to take a closer look at everything.

The current Imperial Palace is located on the former site of Edo Castle, a large park area surrounded by moats and massive stone walls in the center of Tokyo, a short walk from Tokyo Station. It is the residence of Japan's Imperial Family. Edo Castle used to be the seat of the Tokugawa shogun who ruled Japan from 1603 until 1867.

Ginza is a district of Chūō, Tokyo, located south of Yaesu and Kyōbashi, west of Tsukiji, east of Yūrakuchō and Uchisaiwaichō, and north of Shinbashi. It is a popular upscale shopping area of Tokyo, with numerous internationally renowned department stores, boutiques, restaurants and coffeehouses located in its vicinity. It is considered one of the most expensive, elegant, and luxurious streets in the world. Ginza was a part of the old Kyobashi ward of Tokyo City.
A shopping street of over 200 meters, called Nakamise, leads from the outer gate to the temple's second gate, the Hozomon. Alongside typical Japanese souvenirs such as yukata and folding fans, various traditional local snacks from the Asakusa area are sold along the Nakamise. The shopping street has a history of several centuries.

The Sumida River is a river that flows through Tokyo, Japan. It branches from the Arakawa River at Iwabuchi and flows into Tokyo Bay. Its tributaries include the Kanda and Shakujii rivers. What is now known as the "Sumida River" was previously the path of the Ara-kawa. However, towards the end of the Meiji era, work was carried out to divert the main flow of the Ara-kawa to prevent flooding.